SOAP and SANITARY CHEMICALS

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ANTI-SLIP

Conditioner Cleaner

ALKATROL

No Other Cleaner Has All These Features!

ALKATROL

1. Lowers labor costs in eleven ways.
2. Performs perfectly in any kind of water.
3. Enhances wax film and leaves surface bright.
4. Removes scum and film without rinsing.
5. Perfectly conditions floors for easy maintenance.
6. Safe for the floor; safe to walk on.

Sell ALKATROL Conditioner Cleaner under your Private Label — It has more selling features than any cleaner on the market!

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Most cleaners leave a dangerous, slippery film on the floor. That's why you should sell a cleaner that is recognized as anti-slip. That's why you should sell ALKATROL, the "de-alkalized" Conditioner Cleaner. It's *safe* for any type of floor.

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Manufacturers of quality waxes, soaps, cleaners, disinfectants, chemical specialties.

AS THE EDITOR SEES IT

TO INCLUDE soaps under the provisions of the Federal Food, Drug and Cosmetic Act, from which they are now specifically exempted, is the purport of a bill to amend this law. Fathered by none other than Senator Guy M. Gillette, chairman of the subcommittee on fats and oils before which much-publicized hearings on soap and detergent marketing and manufacture were held last month, the proposed amendment is the culmination of a lot of talk and testimony in Washington,—and an obvious knife-thrust at the soap industry.

That it would penalize the average small soaper far more than his better-equipped large competitor is apparently of little moment. Soapers must pay for recent low tallow and grease prices for which they erroneously have been held responsible; they must pay for using foreign oils made by "cheap coolie labor"; they must pay for marketing synthetic detergents in competition with soaps made from farm-produced fats.

In this way, apparently, the Gillette group intends that they shall pay for their sins. But, we do not believe that there is danger that this proposed amendment to the Food, Drug and Cosmetic Act will become law during the current session of Congress. The proposal is so wholly without merit that there is difficulty in seeing how it ever could pass either house.

When we say that this proposed amendment was conceived in gross ignorance, we have only to point to the comments and questions of those in high government places at the fats and oils subcommittee hearings last month in Washington. Once again, these emphasized that not only the soap industry, but all American industry, is in reality at the mercy of uninformed or misinformed politicians with axes to grind. That they have the power to do irreparable damage to to industry through unnecessary, unfair and misdirected regulation is apparent. That smaller manufacturers are always hit hardest, public benefits are questionable, and costs to the ultimate consumer invariably rise as a result of these regulatory efforts never seems to matter. Someone gets a brainstorm,—and to hell with facts!

After long hearings prior to passage of the present Food, Drug and Cosmetic Act some years back, soaps were exempted. Regulation then was deemed unnecessary. And the situation today is no different. If the so-called Gillette group has doubts of this,—or if they have any real interest in getting at the facts, which we doubt,—let them read the report on the soap exemption hearings which they apparently have not bothered to do thus far.

SEARCHLIGHTS of introspection are being focused upon retail advertising of late by groups of large advertisers and by a few bigwig consumer magazines. They may or may not find out the truth. A good chance exists that they will make the same mistake as the poll takers last fall and ask the wrong people. But, if they do find out the truth, we doubt that they will tell it except perhaps to each other behind closed doors. Because, on the whole, we have a hunch that public opinion of the great bulk of consumer advertising, particularly radio advertising, is far from high.

"What does the public really think of advertising?" This was the theme question behind a program staged not long ago at which several outstanding advertising authorities were the speakers. Each speaker, according to summaries of their remarks, went into the subject in what obviously was supposed to pass as a frank, without-kid-gloves discussion of the "facts." But, it all sounded quite familiar and had the ring of the same old malarkey dished up with a good sprinkling of advertising double-talk. One speaker showed by figures and percentages that woment buy just about everything which men use. Strangely

enough, this was a representative of a woman's magazine. Another speaker expressed the opinion that both husbands and wives are "well aware" of advertising, a truly astounding conclusion. And 88 per cent of wage earners listen to radio commercials. And so on ad infinitum.

Nobody asked us what we think about advertising or what we think the public thinks about it. But, from casual observations over the years, we feel that this could be summarized in the hackneyed expression, "confidentially, it stinks." Maybe we are prejudiced, but we believe that this applies more aptly to radio than to the printed page. However, an advertising man once answered our criticism by stating: "So does garbage, but it makes wonderful hog feed." And there we have it. But, it still doesn't explain away that inflection of disbelief in the housewife's voice when she says: "Oh, that's just advertising." We still choose to believe that today a lot of retail products are being sold successfully *in spite of their advertising*.

WHEN we hear retailers damn soaps and cleansers because, they say, the margin is so small it does not pay to handle them, we are always intrigued by the course of their pricing policies. During the past year or so, it has seemed to us that as fast as manufacturers reduced soap prices, the retailers have followed them right down. Why, we have thought, if their margin is so slim, do they not hold their prices through one or two manufacturers' cuts, and move their profits up to a level more to their liking? But, the fellow down the street has cut his price, so they feel compelled to follow. Well, if the chiseling SOB down the street is to blame, why curse the product or the manufacturer? He only makes the stuff; he doesn't retail it.

Soap sales trends over the past two years, we believe, would tend to support the conclusion that within a normal range, a few per cent one way or the other in retail prices in the same store has little bearing on sales volume. Competitive conditions being comparable, chips may sell as readily at 28 cents per package as at 26 cents. If this be true, and our observations incline us to believe that it is, why will dealers sell at 26 cents and at the same time squeal about the slim profit?

RECENT advances in tallow and grease prices have just about doubled the market value of these commodities during the past month. From a glutted, stagnant market, the situation changed to a brisk upward movement in demand and price as the effects of reduced production and renewed buying made their presence felt. Within sixty days, the law of supply and demand appears to have accomplished what it was proposed to do by legislation, and to have accomplished the result without the aid of a legislative crutch.

That the upswing in tallow has changed the complexion of the soap market is quite apparent. Those soapers who were stuck with high-priced tallow when the deluge came, are in a relatively better position today. They may get out with a whole skin, which was a brighter prospect than they faced when tallow was flat on its back. If we might now have a strong, steady tallow market for the next few months, we believe that the stabilizing effect would be welcomed by most soapers. For those who had the storage facilities and the money, and who failed to cover every pound possible at the low levels, we feel sorry. All we can say is that we told you so!

SYNTHETIC detergents have just been discovered in a big way by some of the newspapers and general magazines. Probably as an outcome of the fat and oil hearings before the Gillette subcommittee of the Senate, the columnists and feature writers have been going to town during the past several weeks. Rushing sensationally to conclusions as they invariably do, these great purveyors of the only true word have already signed the death warrant for soap. Soap is done, *fini*, a gone goose! So are inedible tallow and grease. From henceforth, they become useless by-products of the packing industry and the common people must pay higher prices for their meat to make up the loss. Behind this "revolution in the washtub" hovers the sinister influence of the soap monopoly foisting its synthetic substitutes for good old soap on the helpless and down-trodden working class. If Mrs. Housewife is not already completely screwed up in her ideas about synthetic detergents, she most certainly will be by the time this barrage of drivel is finished.

Soap Hearings Reviewed

Excerpts from testimony by leading soap and detergent producers before recent hearings in Washington conducted by the Gillette Subcommittee of the Committee on Agriculture and Forestry studying fat and oil price declines.

TESTIMONY by soapers before the Fats and Oils Subcommittee of the U. S. Senate Committee on Agriculture and Forestry, last month in Washington, brought forth a multitude of factual information and some wild charges of monopoly, price fixing and patent controls. Data supplied by representatives of the three largest American soap companies indicated no reduction in fat and oil consumption by soapers, no material inroads into soap use by synthetic detergents, and a serious overproduction of tallow and grease in 1947-48.

Ernest O. Gillam, owner of the Gillam Soap Works, Fort Worth, Texas, who stated that he was the "recognized head of the independent soapers for all these years," attacked the "major soapers" as a monopoly and called for a disbanding of the Association of American Soap & Glycerine Producers as the tool of the three "major soapers" for controlling oil, fat and soap prices. Upon questioning, he stated that many other soapers also belonged to the AASGP, but that they were just "hangers on." Mr. Gillam stated that he was head of the "National Independent Soapers of America," but upon questioning by Chairman Gillette (Senator Guy M. Gillette of Iowa), admitted that no such organization existed.

Manipulations of the fat and oil markets by the large soapers were responsible for the sharp rises and falls in prices, Mr. Gillam said in his testimony, and the large companies forced the smaller soapers to pay higher prices for fats. At one point Mr. Gillam charged that the "major soapers" undercut his soap prices in some parts of the Texas market so that he could not compete. He later accused them of charging much higher prices than those for which he sold his soaps. He also accused the renderers of "greed and bad judgment . . . in giving preference in their sales of fats to the big soapers instead of selling to the small independents" and stated that this was responsible for present low fat prices. He predicted the destruction of the small soaper as time goes on at the hands of the "monopoly" and said that there should be a "prosperous little soap factory" in every town and city of 25,000 people.

Mr. Gillam also explained how he left the glycerine in his soap and did not remove it to sell separately, and thus his soap was much superior to those with the glycerine removed. Senator Gillette asked him if the large soapers were lowering the quality of their soap by removing the glycerin, and he answered that he "claimed" that they do. "Soap without glycerine or some other kind of a water softener or material to lower the water tension," said Mr. Gillam, "is not effective." His larger competitors, the witness charged, "come up with all kinds of things like 'Solium' . . . and it is just some kind of substitute for glycerine." Later Mr. Gillam indicated that he is preparing to change his operations so that his plant will be able to recover by-product glycerine.

Mr. Gillam stated that he believed his son-in-law "is the best soap chemist in America today." As his testimony ended, Senator Gillette mentioned that this committee is not primarily interested as a subcommittee in monopolistic practices.

E. O. GILLAM

IN his appearance before the committee E. H. Little, president of Colgate - Palmolive - Peet Co., Jersey City, N. J., cleared up a number of misconceptions which had apparently existed in the minds of some of the committee members. It seemed to come as a considerable surprise to Senator

E. H. LITTLE

SENATOR GILLETTE

Gillette, chairman of the committee, for example, to learn that sales of soap have increased rather than decreased over the past ten years during the same period that sales of synthetic detergents have jumped from almost nothing to over 600 million pounds.

Mr. Little emphasized that the American soap industry is currently "selling more soap in pounds, with the exception of 1947, and using more tallow and grease than in any other year in the history of the country." This important industry figure Senator Gillette termed "very significant," indicating that his committee had been "going on the theory, from suggestions that have been made by witnesses, that this detergent development was driving the market for tallow and greases and domestic inedible oils out of the picture."

Mr. Little expressed confidence in the future of synthetic detergents. They "are here to stay," he said, "and they are going to grow some more, I think, because the consumer is going to demand them . . . Repeated tests with consumers comparing soaps with detergents indicate that consumers recognize the superiority of detergents over soaps. . . . We do everything we can to sell every ounce of soap that we can, and everything we can do to sell every ounce of detergents we can. We would just as soon sell one as the other."

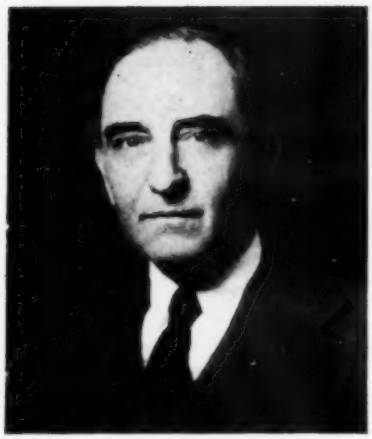
"There is no more gross profit in detergents than in soaps," he indicated. "The gross profit percentages of both soap and synthetic detergents have been subject to considerable variation because of varying raw material and finished product prices. Heavy duty synthetic detergents have the same selling price as the heavy duty type of packaged soap. . . . Based on present selling prices and present market prices of raw materials, the gross profit percentage is less on these heavy duties (synthetics) than the gross percentage profits on soaps."

In the portion of his testimony dealing with tallow and grease supplies and prices, Mr. Little pointed out that there has been a tremendous increase in production of both as compared with pre-war years, which is the logical explanation for the current low level of prices. Average production during the 1936-1939 period was 932,000,000 lbs. a year, which amounted to 7.17 lbs. per capita. In 1948 production was 1,935,000,000 lbs., or 13.20 lbs. per capita.

Calling attention to the difficult conditions under which the soap industry has had to operate since the war's end, he observed that he did not know "of any raw material in the United States used by any industry that amounts to anything that has fluctuated since decontrol as much as fats and oils." Yet decontrol, he asserted, was a necessity. "If decontrol had not happened," said Mr. Little, "I think much of the soap industry would have been closed down within a few days, because the supply of tallow and everything else was practically nil."

One possibility of absorbing some part of the tallow surplus might lie in the direction of use of tallow in production of synthetics, the witness indicated. The Colgate-Palmolive-Peet Company, he reported, is attempting to use tallow for synthetic production, so far, at least, unsuccessfully. In the course of this discussion, Paul E. Hadlick, counsel for the committee, mentioned that the Appropriations Committee has put into the current Agriculture Department bill some money for research on the further use of fats and oils, raising the possibility that some of this money might be used to further research along this line.

Senator Gillette asked Mr. Little a number of questions connected with the soap industry's use of coconut



R. R. DEUPREE

oil. He seemed to be confused by the soap industry's ability to manufacture increased quantities of soap during the war years, even while cut off from its usual supplies of imported coconut oil. Mr. Little answered that while the industry did get along without normal supplies of coconut oil during the war years, and was still able to turn out an increased volume of soap, soap quality suffered, and to a serious degree. A considerable quantity of fillers and builders was incorporated into wartime soap, at the government's request, he advised Mr. Gillette, to stretch the fat supply. As a result, standard industry products were reduced seriously in quality.

Several questions by Mr. Hadlick on the subject of labeling gave an indication of the way the committee's thoughts seemed to be leading. He asked particularly whether there are any requirements on the labeling of soaps to distinguish between synthetics and soaps from natural oils, and followed this with a question as to whether or not there are labeling requirements which call for a statement of the percentage content of imported oils. Both questions were answered in the negative.

A number of questions by Senator Gillette on Colgate's process for production of synthetic detergents again clarified what had apparently been some further misconceptions on the Senator's part. When told by Mr. Little that the Colgate-Palmolive-Peet Co. has its own processes for the manufacture of synthetic detergents, Senator Gillette said "That is a revelation to

me. I assumed that the process was almost identical (with that used by other detergent manufacturers) but that you perhaps copyrighted the name of your product."

RICHARD R. DEUPREE, chairman of the board of Procter & Gamble Co., and Floyd M. Barnes, vice-president, appeared jointly before the committee at another session, a prepared statement being read by Mr. Barnes, followed by questioning by the commitee members on some of the details. Mr. Barnes pointed out that over-production of fats, rather than under-consumption, is the most important factor bearing on the fat and oil situation today. The production of all types of animal and vegetable fats and oils was stimulated by the high post-war prices offered by a fat-starved world, with the inevitable over-production resulting.

This increased production started right back on the farm, Mr. Barnes pointed out. Average production of inedible grease in the U. S. was 5.5 lbs. per hog back in the 1936-39 period. This rose to 7.6 lbs. per hog in 1948. Production of tallow from cattle rose proportionately, the figures being 27.8 lbs. per head in 1936-39 and 39.4 lbs. per animal in 1948. As a result tallow and grease production this year is on the basis of 2,100,000,000 lbs., as compared with 908,000,000 lbs. back in 1936-39.

To add to the glut of tallow, non-soap usage has fallen off sharply from war-time and immediate post-war levels. Where 500,000,000 lbs. of tallow went into non-soap production in 1945, this year such consumption is on the basis of only 300,000,000 lbs. Use of tallow in production of synthetic rubber, for instance, has dropped sharply. It reached 96,000,000 lbs. in 1945, but will not exceed 22,000,000 lbs. this year, Mr. Barnes stated.

The soap industry is anxious to use maximum tallow percentages in its formulas, Mr. Barnes made clear, "We are not using a pound of cocoanut oil that we could get along without, for the simple reason that the cost is three times as much as domestic tallow." He emphasized that his company is doing everything possible to expand

FLOYD M. BARNES

use of tallow and grease in soap production. They have spent several million dollars in the past few years, he pointed out, in building hydrolyzer plants to up-grade inferior fats and make it possible to use them in soaps. He expressed optimism, also, that in the near future it may be possible to utilize tallow and grease in some types of synthetics.

Mr. Deupree offered some interesting figures on what the drop in the price of glycerin has done to soap manufacturing costs. "When we were getting 60 cents a pound for glycerin," he reported, "we got approximately two pounds of glycerin to a box of soap, so we got $1.20 for our glycerin out of one box of soap. Today we are getting 24 cents for our glycerin, let us say. That is 48 cents. You put 20 pounds of fat into a box of soap, so you get a credit of 2.4 cents per pound on the fat content of the soap. When glycerin was 60 cents, you had a credit of six cents a pound which made it cheaper to produce soap than it is today."

Commenting on the sharp drop in tallow prices this year, Mr. Deupree reminded that after World War I much the same price pattern was recorded. Tallow dropped from 19 to three cents per pound in one year. This time the drop has been from 27 to four cents. The drop was not at all unexpected, Mr. Deupree indicated. "The fats were not needed and the whole fat structure sank down somewhere near its proper level where we would have guessed it would be on a postwar basis. In fact, it took much longer to reach what we call the ten-cent level of fats than we thought it would take."

Commenting on coconut oil prices, Mr. Deupree described them as "prohibitive" and charged government manipulation of markets with responsibility. For 25 years, he reminded, the coconut oil price was a cent to a cent and a half above tallow. Today it is nearly three times the tallow price. Coconut oil should be selling in the U. S. for about eight or nine cents a pound, duty paid, he observed.

Turning to the subject of synthetics, he confirmed the testimony of previous witnesses that the new market for synthetics has not cut into the soap market to any serious extent. This year, he estimated, the soap industry will produce 3,200,000,000 lbs. of soap products, plus an additional 800,000,000 lbs. of cleansers of all kinds other than soaps. Out of a total usage of almost four billion pounds, about twenty per cent will thus be represented by synthetics.

CHARLES LUCKMAN, president of Lever Bros. Co., Cambridge, Mass., and of the Association of American Soap & Glycerine Producers appeared before the committee on August 11, accompanied by the following Lever executives: James Barnes, Abe Fortas, Nelson T. Joyner, James F. Reeves and A. J. McLaughlin. In introducing his prepared statement Mr. Luckman reminded the committee that while there may be a surplus of fats and oils in the domestic market, there is still an acute world shortage. The world needs at least six and a half billion pounds of additional production of fats and oils, he stated, to return even to an admittedly inadequate prewar level of consumption.

He corrected another common misconception when he pointed out that the United States is currently an exporter rather than an importer of fats and oils. There is apparently a widespread and mistaken belief, he indicated, "that we are importing more fats and oils, and exporting less than we have in the past, with many people blaming this situation for the surplus supplies and low prices now existing.

CHARLES LUCKMAN

The facts show exactly a reverse situation." In the period from 1937 to 1941 average imports were two billion pounds and exports a half billion pounds, giving an import balance of one and a half billion pounds. In 1948 we imported 1,300,000,000 lbs. and exported 1,000,000,000 lbs. leaving an import balance of only 300,000,000 lbs. In the first five months of 1949 we have imported only 380,000,000 lbs. of fats and oils and have exported 1,130,000,000 lbs., giving us an export balance for this period of 750,000,000 lbs.

In taking up the subject of synthetics Mr. Luckman observed that while the expansion in synthetic sales has not been accompanied by any drop in soap sales, the sales gain in synthetics has definitely prevented a possible expansion of 11 to 16 per cent in soap usage that might otherwise have taken place. He estimated on the basis of these figures that a potential market for sale of about 350,000,000 lbs. of tallow and grease per year has been lost.

Turning to consideration of production costs and profits on synthetics as compared with soaps, Mr. Luckman observed that "a pound of synthetic detergent costs us a great deal more to make than a pound of soap of a comparable kind." His company, he said, from a profit standpoint looks upon synthetics as "a field which we do not anticipate with very much relish, but we feel that we must be in that field in order to protect our total position in the soap and detergent field."

In the soap business, he indicated, "it is not uncommon to launch a new product, soap or synthetic, and lose a substantial sum of money in the introduction". "In order to establish a big-name brand of large volume", Mr. Luckman commented, "you must be prepared to lose a very substantial sum of money."

Commenting on soap prices, Paul E. Hadlick, counsel for the committee stated that the charge had been made by some complainants at the hearings that while fat and oil prices had dropped 75 to 80 per cent from the highs, soap prices have been decreased only 30 per cent. Another complaint that has been made, he added, is that "the profits made in the manufacture of soap, by maintaining such high soap prices, are being used to put synthetic detergents over on the American market." The committee has been seriously concerned with trying to determine whether or not such charges as these have any basis in fact.

Mr. Luckman, in reply, pointed to the long standing policy of many soap companies in basing their prices on average fat and oil costs over long term periods. Thus soap prices never reflect peak fat and oil levels, and neither do they drop as rapidly nor as far as fat and oil markets. He suggested that the Association of American Soap and Glycerine Producers might supply the committee with analyses of soap retail prices and costs of raw materials. He mentioned further that there are other important factors affecting soap selling prices in adition to raw material costs, such as higher wages, higher costs of raw materials other than fats and oils such as cartons and containers, increased overhead costs of doing business, etc., all of which would need also to be taken into account.

Mr. Hadlick asked a number of questions relating to Lever purchases of raw materials in the United States and the position of Unilever World-Wide in world fat markets. Mr. Luckman answered that in the United States Lever Bros. buy only six per cent of total fats and oils, and this is not a sufficiently large share of the supply, he indicated, to make the company a dominant influence in the market. The

GEORGE PARKHURST

charge, Mr. Hadlick repeated, was not that Lever alone exercised any such control, but that the three major soap companies among themselves controlled much more than six percent of the total fat and oil market, and an even more substantial share of the market for soap fats, particularly tallow and grease.

A minor point touched on by Mr. Luckman in his testimony was the clarification of what "Solium" is, a product mentioned by a previous witness. It is an ingredient of Lever's "Rinso", Mr. Luckman pointed out, a fluorescent whitening agent which makes washed clothes reflect more light. It is definitely not a water softener, as the previous witness had indicated, Mr. Luckman pointed out.

CHARLES SAWYER, Secretary of Commerce, appeared before the committee August 7, and reviewed some of the historical background on fat and oil export controls and their eventual removal. Commenting on statements that had been made attributing the break in fat and oil prices to the continuance of export controls and the inadequacy of export quotas, he denied very strongly that these were even a minor contributing factor in the drop in fat and oil prices. To support this position he called attention to the fact that, during the export quota period, actual exports of fats and oils were less than the amounts allocated and licensed for export. Failure of foreign buyers to take excess Amer-

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This article is based on a report prepared by York Research Corp. of Stamford, Conn., technical consultants to the American Hotel Association.

RECENT years have witnessed a tremendous growth in wall-to-wall installations of carpeting throughout the hotel industry. In general, dry maintenance of such carpeting poses no special problems. However, as soil loads become severe, wet-cleaning is periodically required. Since it is impractical, in most cases, to remove these permanent carpet installations for wet shampooing in cleaning plants, it has become necessary to accomplish the cleaning on the premises. As a result, "on-location" cleaning techniques have been developed to meet this peculiar problem.

In recent months a great volume of requests has been received from hotels for information concerning the best methods and shampoos to accomplish this location cleaning. After studying the problem it became evident that no wide agreement existed, even among the cleaners in the field, of what constitutes the best procedures and safest shampoos for location carpet cleaning. When one also considers the terrific investment in carpeting, it is readily appreciated that this was a problem requiring a major investigation. Accordingly, the American Hotel Association undertook organization of such a program which ultimately was sponsored by the A.H.A., The Carpet Institute, Inc., and the National Institute of Rug Cleaners, Inc. The work was carried out at the York Research Corporation laboratories, under the direction of a technical committee representing all three sponsoring organizations. The general conclusions have been published by the American Hotel Association under the title, "Carpets and Their Maintenance."

Value of the Launder-Ometer

HAVING established a standard rug cleaning procedure, the way was open to determine whether or not the Launder-Ometer, which has been widely used for the study of detergency on wool, was a suitable means of screening on-location rug shampoos. Therefore 8 soap products and

9 synthetic rug shampoo materials were tested for detergency values on the rug cleaning machine and in the Launder-Ometer. As Launder-Ometer studies are usually run at the critical concentration of particular detergents, these studies were run at .3 per cent and .6 per cent, as well as at the manufacturer's recommended concentrations. Table I shows the detergency levels obtained in both procedures.

The Launder-Ometer studies were conducted on Botany worsted wool containing a standard wool soil and were run in an Atlas Launder-Ometer in soft water (90 ppm, calcium magnesium hardness). This technique has been widely used for determination of wool detergency, particularly with synthetic materials.

Table I shows a wide discrepancy in the relative efficacy of compounds when cleaning on the laboratory rug machine and when using the Launder-Ometer. As a matter of fact, the group of compounds which have the highest detergent power, according to field experiences, did not rank amongst the first five compounds in the Launder-Ometer evaluations. In tests at the lower concentrations, only one soap showed any detergency at all on the Botany wool. The five best compounds, according to the rug cleaning machine results, were soap products. In the opinion of various professional rug cleaners these gave excellent cleaning in on-location work. From these data it was concluded that evaluation of rug shampoos by Launder-Ometer methods would not be satisfactory for this project or for future screening of such compounds.

A further, and perhaps more important, conclusion to be reached from this table is that carpet cleaning could be accomplished at an adequately brilliant level with the use of a good number of synthetic detergents. For example, it is noted that six of the synthetic detergents showed over 20 per cent detergency in the first cleaning operation, a level comparable to that obtained by over half the soaps tested. These conclusions were amply verified in field tests with specific products during the course of the project and since the completion of this work, have become widely accepted in the industry.

During routine tests on the rug cleaning machine, carpets were weighed before and after cleaning and after vacuuming. The vacuuming took place within two minutes after the cleaning operation. The last column in Table I illustrates the wet pick-up of the carpets, using a standard amount of liquid, and brings to light the little appreciated fact that the actual water pick-up in wet shampooing is usually less than 20 per cent of the total liquid used. It is important to note also that the amount of extractable liquid does not differ significantly if a soap or synthetic has been used. In view of the common belief among operators that synthetic detergents will wet-out a carpet more than soaps, these data prompted further study of the elements of cleaning.

Using an electrical circuit to measure the speed of wet-thru of soaps and synthetics, it was found with medium pile velvet carpet that the differential was in the range of 6 to 12 seconds. This is insufficient time for operators to effect a wet-pick-up with conventional equipment which would make any significant differences in gross wet-out. Where the same amount of solution is used, whether soap or synthetic, a similar degree of wet-thru can be expected. Therefore, amount of wet-thru is not directly attributable to the type of shampoo used, nor the direct cause of the wide variation in wet-thru reported by operators. It is our opinion that it is more related to the techniques of carpet cleaning, established by operators who have long been familiar with handling soaps, than by any measurable differences between soaps and synthetics. Attempts were made to study the factors which might be influencing the opinion held by operators and the conclusions drawn are reported below.

Our main conclusion, therefore, from the data in Table I is that synthetic detergent shampoos could be used to obtain adequate cleaning and that no inherent factor in their wetting-out action should preclude their use.

The results obtained by wet shampooing can vary extensively. Even when the same shampoo is used, two operators may report dissimilar results.

TABLE I
Comparative Detergency of Compounds by Launder-Ometer and Rug Cleaning Machine Methods

	Compound	Mfg. Recommended Use Concentration	Detergency in Launder-Ometer Studies Det. at Use Conc.	Det. at 0.6%	Det. at 0.3%	Launder-Ometer Rank Based On Use Concentration	Detergency Using Rug Cleaning First Cleaning	Second Cleaning	Rug Cleaner Rank Based on First Cleaning	Picked-Up Liquid Remaining In Rug After Vacuuming
1	Soap	5%	40%	0%	0%	6	24%	44%	8	68%
2	Soap	6%	15%	0%	0%	13	27%	62%	5	75%
3	Soap	6%	72%	0%	0%	1	18%	37%	15	80%
4	Soap	5%	12%	0%	0%	16	30%	52%	2	78%
5	Soap	5%	43%	0%	0%	4	31%	54%	1	79%
6	Soap	1.5%	57%	60%	65%	3	28%	61%	4	73%
7	Soap	6%	12%	0%	0%	15	24%	42%	9	79%
8	Soap	6%	7%	0%	0%	17	30%	46%	3	81%
9	Synthetic	2.4%	15%	7%	5%	12	25%	47%	6	84%
10	Synthetic	100%	32%	0%	0%	8	23%	45%	10	90%
11	Synthetic	2%	13%	43%	50%	14	23%	40%	11	88%
12	Synthetic	2%	37%	18%	5%	7	21%	37%	12	67%
13	Synthetic	6%	27%	0%	0%	9	18%	40%	14	61%
14	Synthetic	5%	22%	6%	5%	11	24%	48%	7	86%
15	Synthetic	0.25%	23%	25%	15%	10	20%	38%	13	86%
16	Synthetic	0.5%	5%	3%	8%	18	16%	31%	16	....
17	Synthetic	0.4%	42%	33%	22%	5	14%	35%	18	....
18	Synthetic	0.25%	58%	60%	60%	2	15%	41%	17	78%

TABLE II

Prefoaming vs. Conventional Feed

	REGULAR FEED			PREFOAMED FEED	
	Detergency	% Liquid Remaining In Rug After Vacuuming		Detergency	% Liquid Remaining in Rug After Vacuuming
Synthetic	2%	24	88%	18	88%
Soap	5%	30	86%	18	84%
Soap	10%	33	90%	21	87%

The type of operation, the skill of the operator, and the selection of equipment all affect the results, probably to an extent as great as the choice of the shampoo. Recognizing these facts, and also those reported previously on wet pick-up and wetting-out of carpets, it seems apparent that control of cleaning techniques can significantly broaden the range of detergents which can be used to achieve satisfactory cleaning.

While it was not possible, in this project, to adequately analyze all of the variables present in carpet cleaning, an attempt was made to separate some of these factors and at least to indicate the direction in which work would have to be done to obtain good results. The data have been based upon work not extensive enough to indicate precise volumes, concentrations, and methods of operation. However, by assuming the validity of the results obtained by limited investigation, it is possible to draw some conclusions. Application of these conclusions to field work has already proved valuable.

Effect of the Brush Fiber

THE major fibers being used in rotary cleaning machines, other than nylon, are bassine, palmetto and tampico. Some brushes are constructed entirely of bassine, some of palmetto and many of concentric rings of these three fibers. In such brushes, the harsher fibers are at the periphery of the brush and the softer fibers at the center.

Standard soiled carpets were cleaned with brushes of these three different fibers, using constant volumes and concentrations of solution and equal periods of brushing. The tampico fiber showed 11 per cent detergency, the palmetto 28 per cent and the bassine 39 per cent. Of the three, the palmetto fiber is most satisfactory since adequate detergency is achieved with a minimum of pile damage.

An analysis of the effect of brush pressure indicated that increases in such pressure, as might be obtained with heavy machines, have no significant influence in increasing detergency values.

Effect of Foam on Wet Pick-Up and Detergency

SOAP and synthetics were used to clean carpets, according to standard procedure, utilizing the regular feeding system and prefoaming the detergent before feeding. Prefoaming was accomplished in a Waring blender and the foam spread on the carpet while brushing. Consequently, prefoamed detergents are added as a rather stable foam. Detergency values and weight increase of the carpet due to absorption of water, are indicated in Table II. It can be noted here again, that although wet-thru is more rapid with synthetics than soap, it makes no substantial difference in the amount of liquid remaining in the carpet if the original volume of solution is the same. In other experiments the time between shampooing and vacuuming (which had been standardized at 30 seconds in Table II) was extended to 3 minutes with no change observed in the wet pick-up. However, when this time was decreased to a few seconds by closely following the brush with the vacuum, the wet pick-up could be increased to approximately 50 per cent for either the soap or the synthetic.

We can conclude from these data that differences in speed of penetration between soaps and synthetics are of such a nature as to affect the manner of detergency but not, intrinsically, the amount of liquid left in the carpet. In field work it was found that no wet-thru resulted with the use of either soap or synthetics when the amount of liquid was carefully controlled. However, when the amount of liquid was high enough, wet-thru of the carpet backing occurred indiscriminately. Further analysis of this factor showed that, in use, soap shampoos produce a stable foam which can be used by the operator as a guide to the amount of liquid he is applying to the carpet; also that this stable foam can be intensified by increasing the concentration of the soap solution. The low-foaming character of synthetic detergents, and particularly the lack of stability of this foam in the presence of heavy soil loads, prevents the operator, who is unaccustomed to using them, from accurately judging how much solution he is applying to the carpet. Consequently, this leads to wet-thru of the carpet in many cases where synthetics are used.

In connection with the question of wet-thru, it is worthwhile to note that the Von Schrader Deterger, a specialized location cleaning device, is so constructed that the vacuum traverses the carpet directly behind the brush. Examination of this machine under field conditions showed that it

(*Turn to Page* 145)

TABLE III

Effect of Volume, Concentration and Brushing Time

Volume of Detergent[1]	(No. of Circuits[4] of the Turntable) Time of Cleaning	Soap Concentration	Percent Detergency	Synthetic Concentration	Percent Detergency
75cc	2 revolutions	5%	30	3%	28
75cc	4 revolutions	5%	30	3%	28
75cc	2 revolutions	10%	33	4%	24
75cc	5 revolutions	—	—	3%	25
75cc[2]	5 revolutions	—	—	3%	34
150cc	4 revolutions	5%	38	0.5%	34
150cc	4 revolutions	—	—	1%	40
75cc + 75cc[3]	2 + 2 revolutions	5%	52	2%	40

(1) 75cc of detergent is added during the first two revolutions of the turntable.
(2) The 75cc was added slowly during the entire 5 revolutions of the turntable.
(3) These samples were recleaned after drying.
(4) The number of circuits describe the real time in cleaning each sample.

Fatty Acids

By R. A. Behrmann*

IF NATURE had provided us with fats and oils composed of glycerides of pure fatty acids, soapmaking would be distinctly simplified. Instead, however, we find mixtures of fatty acids of varying chain lengths and degrees of unsaturation, and in addition, such complicating factors as unsaponifiable matter and natural variations of composition, even for the same raw material. In spite of this, an understanding of the properties of pure fatty acids as well as how soap performance is affected by variations in molecular structure, is helpful in predicting the properties of soaps made from the mixed glycerides of fatty acids as we find them in nature. Soap-forming properties are found in the mono-carboxylic acids of C_{10} through C_{18} molecular weight. Below ten carbon atoms, the metallic salts are too soluble to form suds in water and exhibit negligible detergency, and when one gets down to C_6 these compounds are no longer classed as soaps but are called "salts." Derivatives of C_{20} and higher acids, on the other hand, are too insoluble to function effectively as soaps at normal temperatures.

Figure 1 shows the fatty acids commonly found in natural fats and oils. As one goes down the chart in order of increasing molecular weight, the soaps decrease in solubility, assuming a constant temperature, of course. A stearate soap, for example, does not dissolve appreciably in water at room temperature whereas a laurate is quite soluble. Although the fatty acids themselves are only very slightly soluble in water, the data in Figure 2 show how solubility decreases as molecular weight increases. These data give a relative idea of the solubility of corresponding soaps of a given alkali.

In addition to chain length being an important solubility factor, saturation of the molecule makes an appreciable difference. In general, solubility increases as unsaturation, or number of double bonds, increases. Thus a soap of oleic acid is more water soluble than a stearate, and a linoleate even slightly more soluble. Solubility data for the C_{18} acids themselves in methyl alcohol serve to illustrate solubility characteristics as related to unsaturation.

The unusual solubility of an oleate soap, in contrast to the low solubility of the corresponding stearate, has been explained on the basis of molecular constitution.

FIGURE 1

Fatty Acids Contained in Most Common Natural Fats and Oils

No. of Carbon Atoms in Chain	Saturated	Mono-Unsaturated	Di-Unsaturated	Poly-Unsaturated
6	CAPROIC			
8	CAPRYLIC			
10	CAPRIC			
12	LAURIC			
14	MYRISTIC			
16	PALMITIC	PALMITOLEIC		
18	STEARIC	OLEIC	LINOLEIC	LINOLENIC
20	ARACHIDIC	GADOLEIC		ARACHIDONIC
22	BEHENIC	ERUCIC		CLUPANODONIC

FIGURE 2

Solubility of Fatty Acids in Water (g./100g.H_2O)

	20°C.	60°C.
Caproic Acid	0.968	1.171
Caprylic Acid	0.068	0.113
Capric Acid	0.015	0.027
Lauric Acid	0.0055	0.0087
Myristic Acid	0.0020	0.0034
Palmitic Acid	0.00072	0.0012
Stearic Acid	0.00029	0.00050

Ralston and Hoerr, *J. Org. Chem* 7, 546 (1942).

FIGURE 3

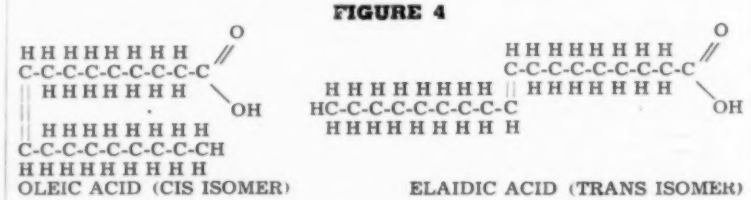
Solubility of Fatty Acids in Methyl Alcohol at —60°C.

Stearic Acid	Insoluble
Oleic Acid	0.40 g./liter
Linoleic Acid	7.26 g./liter
Linolenic Acid	13.80 g./liter

Foreman and Brown, *Oil and Soap 21*, 83 (1944).

AS CAN be seen in Figure 4, oleic acid, or the *cis*-$\triangle^{9,10}$ form, is a warped molecule, and the effective chain length is considerably reduced as compared to stearic acid, which is a straight chain acid having all the carbon atoms in a row. The folded configuration of oleic acid makes it comparable to lauric and myristic acid, and hence its soaps show solubility

FIGURE 4



* Before 35th mid-year meeting National Assn. Insecticide & Disinfectant Manufacturers, Chicago, June 13.

and Liquid Soaps

Emery Industries, Inc.

characteristics more like these molecules than an eighteen carbon atom acid. Incidentally, oleic acid, as it is found in nature, is the *cis* form.

This theory is further supported by the fact that elaidic acid, the geometric *trans*-$\triangle^{9,10}$ isomer, though being a monounsaturated acid with the same number of carbons and hydrogens as oleic, forms soaps of lower solubility and with other characteristics that resemble palmitic acid. Elaidic acid is the stretched-out molecule shown in the diagram. It should be pointed out that the structures as shown are not exact molecular representations, and the carbon atoms actually lie in a zig-zag pattern, rather than in straight rows.

Solubility may also be increased by the presence of hydroxyl groups, as in the case of ricinoleic acid, or castor oil fatty acid. In addition to a double bond, this acid has an hydroxyl group which enhances solubility.

Detergency properties of fatty acid soaps also vary with molecular weight. The higher molecular weight soaps, C_{16} and C_{18}, both saturated and unsaturated, are better detergents than soaps of lower molecular weight acids, particularly at high temperatures. For purposes of simple comparison, laurate soaps work best at room temperature, myristate soaps in lukewarm water, palmitates at about 160°F., and stearates at a slightly higher temperature. There are many factors contributing to detergency, and the subject is too complex to cover in a short discussion.

Another point of interest related to fatty composition is the foaming tendency of various soaps. As the fatty acid chain increases to C_{14} (myristic acid), sudsing reaches a maximum, then decreases as molecular weight increases. Oleate soaps have greater sudsing power than stearates, but the polyunsaturated acids, such as linoleic, seem to affect foaming adversely. Foam stability, as distinguished from foam volume, is superior in the case of soaps of the higher acids, however.

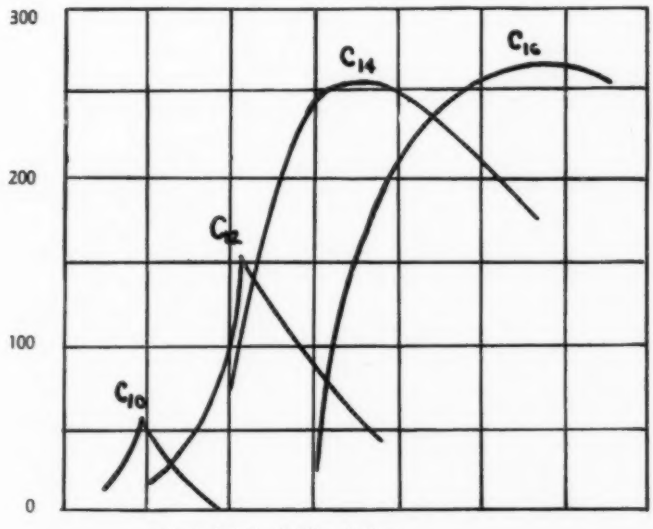
Foam stability and foaming are also influenced by a number of factors. Certain of these, such as the influence of pH, temperature, and the presence of calcium and magnesium ions, have been studied by Ross and Miles of the Colgate-Palmolive-Peet Company. [*J. Phys. Chem. 48*, 280 (1944).] In their investigation of pH effects, they made soaps from relatively pure caproic, lauric, myristic and palmitic acid and determined foam stability using a test they had earlier devised. [*Oil and Soap 18*, 99 (1941).] In the Ross-Miles test, 200 ml. of soap solution falls through an orifice into a glass column containing 50 ml. of the same solution. After a specified period of time, the height of the foam is measured, and the height is considered proportional to volume.

Using 0.10 per cent soda soap solutions, this concentration being selected as optimum for foaming, the pH was varied using HCl and NaOH and the foaming measured. As can be seen, each soap has a critical pH range where foaming is at a maximum. As the pH for each soap reaches a certain point, foaming decreases rapidly. Sodium palmitate foam, for example, is unstable at a pH lower than 9.5. There is also evidenced greater all-around foam stability for the higher molecular weight soaps, and this has been found to be true for both saturated and unsaturated acids at varying concentrations.

Similar experiments were carried out, varying the temperature over

FIGURE 5

Effect of pH on Foam Stability of Soda Soaps of Various Fatty Acids



Miles and Ross, *J. Phys. Chem. 48*, 280 (1944).

a range of 27-82°C., but the influence of temperature was found to be small, foaming tending to increase slightly as the temperature rises.

Ross and Miles also showed that as a rule calcium and magnesium soaps do not act as foam breakers in solutions of soda soaps. The addition of small amounts of calcium and magnesium ions (up to 250 ppm.) had little effect on foaming, except in the case of certain unsaturated fatty acid soaps. They found calcium oleate and calcium ricinoleate break foams completely, but not so in the case of calcium elaidinate — another example of the difference in properties of the *cis* and *trans* C_{18} monounsaturated acids.

It is interesting to note in passing that it has been reported in the literature that the foam stability of mixed fatty acid soaps is greater than in the case of pure products.

II. Soap Properties as Affected by Choice of Cation

THE choice of cations from which soaps can be made also determines soap properties, although the importance of the cation generally is less than the contribution of the anion. Among the inorganic alkalis, caustic soda and potash are the most important. Potash yields more soluble soaps; this is the most significant difference between soaps of KOH and NaOH. Such solubility difference can be explained by the fact that for the same soap concentration, the potash soap contains a higher weight-percentage in the metallic ion, 39.1 being the atomic weight for potassium against 23 for sodium. In other words, the soda soap contains a larger number of insoluble fatty chains for the same weight of soap.

Potash soaps also have greater salt water resistance, as they are not easy to salt out as is the case with soda soaps. Potash soaps have slightly better foaming properties.

Ammonia soaps are used for certain specialty products. Of course, they are unstable and decompose on exposure to air, forming stable but less soluble acid soaps.

In addition to the inorganic alkalis, there is a group of useful compounds of organic nature. Certainly the organic alcoholamines, such as triethanolamine, isopropanolamine, and the like are an interesting group of bases for soapmaking. They form soaps with fatty acids that have unique solubility, being highly soluble both in water and oils, far more soluble than the soda or potash compounds. In contrast to the alkaline properties of soaps made from caustic soda and potash, the alcoholamine soaps are very mild and at the neutral point have a pH of 7.5 to 8.0. Excess amounts of these compounds, over and above that necessary to neutralize a fatty acid, are not harmful to the skin. However, soaps made from these compounds have a tendency to discolor, particularly in the case of the unsaturated fatty acids, which is one disadvantage in their use.

Detergency studies of triethanolamine soaps have been made and these indicate that they are somewhat inferior to soda soaps. The same order of fatty acid chain effectiveness applies, however, the C_{18} soaps being superior to the C_{16}, and the latter better than the C_{14}.

III. Commercial Fatty Acids and Liquid Soaps

ALTHOUGH the fatty acid industry is now producing a number of acids of relatively high purity, the chief fatty acid raw materials used by the manufacturers of soaps are still natural or modified mixtures of varying molecular weight and degree of unsaturation. The acids commonly used include oleic, coconut, cottonseed, soya, and a number of liquid fatty acid fractions derived from various straight vegetable fatty acids or tall oil, either by distillation or fractional crystallization such as is represented by the Solexol or Emersol processes. Turning now to these acids, an examination in the light of their composition and soapmaking properties is interesting. Particular emphasis will be placed on their use in the manufacture of liquid soaps.

Commercial oleic acid, or "red oil," is one of the oldest raw materials known to the soap industry, and has always occupied a position of importance in the liquid soap field. A typical composition for a low titer oleic

(*Turn to Page 98*)

Synthetic Detergents—Up-to-Date

By John W. McCutcheon

Part II

Beginning on opposite page is a continuation of the listing of data on about 750 detergent products. Listings appeared first in Aug. issue, conclude next month.

detergent products. Listings appeared first in Aug. issue, conclude next month.

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Emcol H-65A	Emulsol Corp.	Fatty acid condensation product of a polyhydric alcohol	Emulsifier	Liquid		anionic	Designed to give a 2% oil in water emulsion of chlordane with 2% conc. of the emulsifier.
Emcol H-72 H-74	Emulsol Corp.	Fatty acid condensation product of a polyhydric alcohol	Emulsifier	Liquid		nonionic	An O/W emulsifier designed for chlordane. Mix 45 parts of chlordane in 45 parts of kerosene, clear and add 10 parts of Emcol H-72. Dilute with water as desired. Emcol H-74 is an O/W emulsifier for concentrates containing 8 to 10 lbs. of chlordane per gallon or 4 to 6 lbs. of toxaphene per gal.
Emcol MS MST	Emulsol Corp.	Glycerol monostearate	Emulsifier	Solid	100%	nonionic	Emulsifier for foods, e.g., margarine, etc. See also Tegin, Aldo 33, S-1079. Glycerol monostearate from hardened oils is Emcol MST.
Emcol RDC-D	Emulsol Corp.	Diethylene glycol laurate	Emulsifier	Liquid	100%	nonionic	Surface tension of 0.1% sol. 31 dynes/cm.
Emcol RH RHT	Emulsol Corp.	Blend of mono and diglycerides of fatty acids	Emulsifier	Solid	100%	nonionic	Edible. Used in food, cosmetic and pharmaceutical preparations.
Emery's A509R cationic compound	Emery Industries	Quaternary ammonium salt of a long chain fatty acid	Emulsifying Wetting	Liquid	25%	cationic	Textile; deflocculating agent.
Emery 3X	Emery Industries		Emulsifier			nonionic	See Twitchell 7231 Oil. (Formerly Twitchell Oil 3X)
Emulfor ON	General Dyestuff Corp.	Polyethylene ether of a long chain fatty alcohol	Emulsifier	Solid	100%	nonionic	Emulsifying agent for fats and waxes.
Emulfor ELA	General Dyestuff Corp.	Polyethylene ether of a long chain fatty acid	Emulsifier	Liquid	100%	nonionic	Water soluble. Emulsifier for animal and vegetable fats and oils.
Emulfor AG	General Dyestuff Corp.	Polyethylene ether of a long chain fatty acid	Emulsifier	Liquid	100%	nonionic	Emulsifier for mineral oils. Fat liquoring of leather.
Emulgator (German)							Generic term for a variety of products. Emulgator 1000 = Nekal BX.
Emulphor STS (German) (MW)		A condensation product of diamyl phenol or its homologues and ethylene oxide	Wetting Detergent	Liquid		nonionic	Approx. 7.5 moles of ethylene oxide per mole of phenol. Emulphor MW similar except containing a small amount of lower paraffin fatty acids.
Emulphor STT (German)		Dodecyl toluene sod. sulfonate					Compare Nacconol NR, Santomerse 1, Ultrawet K etc.
Emulphor STX (German)		Dodecyl xylene potassium sulfonate					
Emulgor A*	Glyco Products Co.						Continued under the name, "Goremul" which see.
Emulsept	Emulsol Corp.	$CH_3(CH_2)_nCOOCH_2CH_2NHCOCH_2N(C_2H_5)-Cl$	Germicide Detergent	Liquid	10%	cationic	A cationic germicide with some detergent properties. The 100% active material sold to manufacturers only is E-607 which see.
Emulsept 2X	Emulsol Corp.	Same as Emulsept	Germicide	Liquid	20%	cationic	Double strength Emulsept. Sold to manufacturers only.
Emulside 680B	Van Dyk & Co.	Polymerized higher glycol fatty acid ester	Emulsifier	Liquid	100%	nonionic	An oil in water emulsifier for agricultural sprays with DDT, chlordane, etc. Soluble in kerosene. Insoluble in water.
Emulsifier L45B L32, L34	Jacques Wolf & Co.	Fatty acid ester of higher poly alcohols	Emulsifier	Liquid	100%	nonionic	An oil in water emulsifier for vegetable, animal and mineral oils. L-32 has good solubility in organic solvents and above oils.
Emulsifier L34A L45	Jacques Wolf & Co.	Fatty acid ester of higher poly alcohols	Emulsifier	Liquid	96%	nonionic	A degreasing agent with kerosene in leather industry. The L-45 compound is 85% active and contains 15% water.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Emulsifier O-205	Jacques Wolf & Co.	Fatty acid ester of higher poly alcohols	Emulsifier Dispersant	Liquid	100%	nonionic	Moderately soluble in water or kerosene. Not acid or alkali stable. Uses: mineral, vegetable or animal oil emulsifier; degreasing or lubricating agent.
Emulsifier 610-A	Van Dyk & Co.	Polymerized higher glycol fatty acid ester	Emulsifier Dispersant	Liquid	100%	nonionic	Water soluble. Insoluble in mineral oil. Uses: dispersion of pigments, cosmetic emulsifier, etc.
Energetic	Armour & Co.	Polyoxyethylene ester of fatty acids	Detergent Wetting	Liquid	90%	nonionic	A low sudsing detergent of the Sterox, Ethofat, G-1226, and Nonic 218 type. Uses: laundry work, etc.
Erkalin*							
Ethofat	Armour & Co.	Fatty and rosin acids condensed with ethylene oxide	Detergent Wetting Emulsifying	Solid Liquid Paste	100%	nonionic	A series of compounds from various fat sources, e.g. Ethofat 242, from refined tall oil, Ethofat HFO from hardened fish oil, etc., etc. Represent a wide range of uses from industrial nonionic detergents to latex dispersants.
Ethomeen	Armour & Co.	Tertiary amines	Detergent Wetting	Solid Liquid Paste	100%	cationic	A wide series of compounds with variation in both fatty acid and degree of ethylene oxide substitution. Cationic properties vary between members. Stable to acids and alkalis. Like the Ethofats, code letters represent types of fat used. Thus Ethomeen T is a product from tallow fatty acids. Ethomeen C from coconut fatty acids, etc.
Ethomid	Armour & Co.	An ethylene oxide condensation product of an amide	Detergent Wetting Dispersing	Liquid Paste Solid	100%	nonionic	More acid and alkali stable than the Ethofats and less so than the Ethomeens. A series of products as for Ethomeens, and Ethofats. Best detergent of group is Ethomid RO (Red Oil).
Ethyl Cetab	Rhodes Chemical Co.	Cetyl dimethyl ethyl ammonium bromide	Germicide Bactericide	Powder	100%	cationic	Water soluble up to 25% if solvent assisted. Pharmaceutical product.
Ethyl Decab	Rhodes Chemical Co.	Octadecenyl-9, dimethyl ethyl ammonium bromide	Bactericide	Liquid	100%	cationic	Same as Octimet, only oleic is substituted for stearic. Algicide and slime preventive.
Fab	Colgate-Palmolive-Peet Co.	An alkyl aryl sod. sulfonate plus builders	Detergent	Powder		anionic	A heavy duty cleanser. See also Tide, Surf, etc.
Fex (German) (Retail)			Detergent				Household detergent of the Dreft and Vel type.
Foamole-G	Van Dyk & Co.	Fatty alcohol and amide sulfates and sulfonates	Detergent Wetting	Liquid	50%	anionic	A mixed synthetic suitable for shampoos.
411*	Armour & Co.						
422	Armour & Co.	An alkyl aryl sulfonate plus builders	Detergent	Powder	26%	anionic	A general purpose detergent for household use.
G-917	Atlas Powder Co.	Propylene glycol monolaurate	Emulsifying	Liquid	100%	nonionic	Cosmetics, etc.
G-923	Atlas Powder Co.	Propyl glycol mono-oleate	Emulsifying	Liquid	100%	nonionic	Cosmetics, etc.
G-924	Atlas Powder Co.	Propylene glycol monostearate	Emulsifying	Solid	100%	nonionic	A waxy solid.
G-930	Atlas Powder Co.	Oleic derivative of polyhydric alcohol	Emulsifying	Liquid	100%	nonionic	Oil in water emulsifier.
G-931	Atlas Powder Co.	Oleic acid derivative of a poly-hydric alcohol	Emulsifier	Liquid	100%	nonionic	Water in oil emulsifier for cosmetic and pharmaceutical uses.
G-1096	Atlas Powder Co.	Oleic acid derivative of polyoxyethylene sorbitol	Emulsifier	Liquid	100%	nonionic	Water in oil emulsifier.
G-1164	Atlas Powder Co.	Polyoxyalkylene glucose tetrastearate	Emulsifier	Solid	100%	nonionic	Waxy solid, W/O emulsifying agent.
G-1165	Atlas Powder Co.	Polyoxyalkylene glucose tetraoleate	Emulsifying	Liquid	100%	nonionic	Emulsifying power good. Wetting good. Water insoluble W/O emulsifier.
G-1226	Atlas Powder Co.	Tall oil ethylene oxide condensation product	Detergent	Liquid	100%	nonionic	Identical to Renex

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
G-1394	Atlas Powder Co.	Glycerol polyoxyethylene sorbitol cottonseed fatty acid ester	Emulsifying	Liquid	100%	nonionic	Water soluble. Oil in water emulsifier.
G-1425	Atlas Powder Co.	A lanolin derivative	Emulsifying	Paste	100%	nonionic	Water dispersible for oil in water emulsions.
G-1431	Atlas Powder Co.	A lanolin derivative	Emulsifying	Paste	100%	nonionic	More water soluble than the above. Same purpose.
G-1441	Atlas Powder Co.	A lanolin derivative	Emulsifying	Paste	100%	nonionic	Water soluble. Similar to G-1425 and G-1431 above.
G-1451	Atlas Powder Co.	A lanolin derivative	Emulsifying	Paste	100%	nonionic	Similar to G-1441. Used in cosmetics, etc.
G-1493	Atlas Powder Co.	A lanolin derivative	Emulsifying	Paste	100%	nonionic	Mineral oil soluble.
G-1500	Atlas Powder Co.	Blend of G-1165 and G-2149	Emulsifying	Liquid	100%	nonionic	Thin oil.
G-1584	Atlas Powder Co.	A lecithin derivative	Emulsifying	Liquid	100%	nonionic	Water soluble. Used as emulsifier.
G-2000	Atlas Powder Co.	Mannitan monopalmitate plus polyoxyethylene mannitan monopalmitate	Emulsifying	Solid	100%	nonionic	Used in polishes, insecticidal sprays, etc.
G-2000C	Atlas Powder Co.	Mixture of 45% Span 40, and 55% Tween 40.	Emulsifying	Solid	100%	nonionic	Solid, waxy.
G-2149	Atlas Powder Co.	Polyoxyethylene stearate	Emulsifying	Solid	100%	nonionic	Waxy solid. Wetting poor, interfacial tension excellent.
G-2150	Atlas Powder Co.	Polyoxyethylene propylene glycol monostearate	Emulsifying	Paste	100%	nonionic	Water soluble, wetting fair.
G-2151	Atlas Powder Co.	Polyoxyethyethylene stearate	Emulsifier	Solid	100%	nonionic	Waxy solid, emulsification fair. These series of compounds represent a graduation in emulsification properties by modifying both acid and alcohol chain.
G-2152, G-2153	Atlas Powder Co.	Polyoxyethylene stearate	Emulsifying	Solid	100%	nonionic	Very similar to G-2151 above.
G-2160	Atlas Powder Co.	Polyoxyethylene propylene glycol palmitate	Emulsifying	Paste	100%	nonionic	Semisolid. Interfacial tension of 0.1% sol. against oil is 8.6 dynes/cm.
G-2170	Atlas Powder Co.	Polyoxyethylene propylene glycol stearate	Emulsifying	Paste	100%	nonionic	Interfacial tension of 0.1% sol, against oil is 10.6 dynes/cm.
G-7596 J	Atlas Powder Co.		Emulsifier	Liquid	100%	nonionic	A compound whose properties lie between Renex and Tween 80. Used in dry-cleaning formulations.
Garbase Emulsifier	Carlisle Chemical Wks.	Sulfonated petroleum oil	Emulsifier	Liquid			Similar to Soluble Base 11.
Gardinol*	Gardinol Corp. (Now dissolved)						
Germ-i-tol	Fine Organics, Inc.	Dimethyl benzyl lauryl ammonium chloride	Germicide	Liquid	50%	cationic	A sanitizer. Suggested concentration, 200 PPM. See also Rodalon. Also supplied in a 97-100% active solid. Phenol Coeff. against S.A. at 20°C.-300, at 370°C.-407.
Glim (Retail)	B. T. Babbitt, Inc.	An ethylene oxide condensation product of a phenol	Detergent	Liquid	83%	nonionic	A liquid dishwashing and general household detergent. Base material manufactured by General Aniline & Film Corp.
Glycerol Monolaurate, Oleate Stearate Ricinoleate, etc.	Glyco Products, Alrose Chem. Co. Kessler Chemical Co. Carlisle Chem. Co. Goldschmidt Chem. Co., etc.	As named	Emulsifier	Liquid Paste Solid	100%	nonionic	Emulsifiers of this type also frequently occur under trade names as Aldo 33, Tegin 515, etc.
Gobs-O-Suds (Retail)	Chemical Manufacturing and Distributing Co.	Alkyl aryl sod. sulfonate	Detergent	Solid		anionic	A retail household detergent of the Swerl, Tide, Fab type.
Goremul A	Glyco Products Co.	Polyhydric alcohol ether fatty acid condensate	Emulsifying Dispersant	Solid	100%	nonionic	Wax solid. Formerly named Emulgor A. Water dispersible. An emulsifier in the presence of acids, salts, etc.
Halo (Retail)	Colgate-Palmolive-Peet Co.	Sulfate of mixed fatty acid monoglyceride. Possibly the ammonium salt	Detergent	Liquid		anionic	Shampoo.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Hartofol C	Hart Products Corp.	Alkyl aryl sod. sulfonate	Emulsifier Wetting	Liquid		anionic	Viscous liquid. Soluble in warm water. Use: textiles.
Horn Kem 1	Warwick Chemical Co.	Purified sulfolignin					A dispersing agent.
Hum (Retail)	Theobald Ind.	A built alkyl aryl sod. sulfonate	Detergent	Powder		anionic	A household detergent of class of Tide, Fab, Surf, etc.
Hyamine 1622	Rohm & Haas Co.	Di-isobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride	Germicide	Cryst.		cationic	Sanitizer, textile substantive.
Hyamine 2389	Rohm & Haas Co.	A quaternary amm. chloride	Germicide	Liquid	50%	cationic	Aqueous soln. Also supplied as a 75% isopropanol solution which is oil soluble. Phenol Coeff. against S.A. on 100% active basis, 400-500. Use: Sanitizer, textile substantive, ore flotation, etc.
Hymolon K	Hart Products Corp.	Fatty acid condensate	Detergent Wetting	Liquid	100%	anionic	Textile, wool scouring agent.
Hytergen BM	Hart Products Corp.	Modified alcohol sulfate	Detergent Wetting	Paste		anionic	Textile; scouring agent.
Hytergen GL #10	Hart Products Corp.	Sulfated fatty amide	Detergent Wetting	Liquid		anionic	A water soluble salt free general scouring agent.
Hytergen MV	Hart Products Corp.	Sulfated fatty amide	Detergent Wetting	Powder		anionic	Water soluble. Textile; for print, rayon and cotton scouring.
Igepal B (German)		Alkyl phenol ethylene oxide sulfate	Detergent				
Igepal CA Extra	General Dyestuff Corp.	Alkyl aryl polyethylene glycol ether	Detergent Wetting	Liquid	100%	nonionic	Claimed to lose wetting property when dried on fabric. Textile finishing agent.
Igepal A (German)		Ester of oleic acid and hydroxyethane sod. sulfonate	Detergent Wetting			anionic	
Igepon AP Extra	General Dyestuff Corp.	$R\text{-}COOCH_2CH_2SO_3Na$	Detergent	Solid	51%	anionic	pH of 10% soln. —7.6. Stable to acid alkali and hard water. See U. S. Pat. 1,881,172.
Igepon B (German)		3-hydroxy-1-aminobutane $RCONHCH_2CH_2CH(OSO_3Na)CH_3$	Detergent		60%	anionic	Also called Igepon G.
Igepon C (German)		Sod. salt of sulfated ethanol-amide of oleic acid $R\text{-}CONHCH_2CH_2OSO_3Na$	Detergent		40%	anionic	
Igepon KT (German)		Same as Igepon T only using coconut and palm kernel fatty acids	Detergent			anionic	
Igepon T	General Dyestuff Corp.	A substituted amide $C_{17}H_{33}CON(CH_3)C_2H_4SO_3Na$	Detergent	Powder	33%	anionic	A tauride derivative.
Igepon 702K (German)		Same as Igepon T using 50/50 mixture of myristic and palmitic acids to replace the oleic	Detergent				Used by German soap industry for retail products.
Indrawet (HH)	Industrial Raw Materials Corp.	Alkyl aryl sulfonate	Detergent	Powder	85%	anionic	Single alkyl side chain of C_9 min. High detergency. Indrawet HH is a spray dried product for household use.
Integritol	Hart Harrington, Inc.	A sulfated alkylated benzene	Wetting Penetrating				Alkyl chain is below C_9. Uses: Paints, textiles, leathers.
Intracol Reg., —OA, —O	Synthetic Chemicals, Inc.	Long chain fatty acid amide containing multiple amino groups	Wetting Dispersing	Powder		cationic	Textiles, rubber, pigments, etc.
Intral AE	Synthetic Chemicals, Inc.		Wetting	Liquid	100%	nonionic	Water soluble. Stabilizing and wetting agent.
Intral 224	Synthetic Chemicals, Inc.	Sat. long chain fatty acid ester containing multiple ether linkages	Wetting Dispersing	Liquid		nonionic	Not compatible with organic salts or electrolytes. Uses: Textiles, rubber, etc.
Intral 229, 384	Synthetic Chemicals, Inc.	Sat. long chain fatty acid ester containing multiple ether linkages	Wetting Dispersing	Liquid		nonionic	Water-soluble. Formerly Intral 233.

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Intral 433	Synthetic Chemicals, Inc.	Sat. long chain fatty acid ester containing multiple ether linkages	Wetting Dispersing	Powder		nonionic	Non compatible with organic salts or electrolytes. Textiles, rubber, etc.
Intramine WK	Synthetic Chemicals, Inc.	Sod. salt of sulfated lorol and myristyl collamide	Detergent Wetting	Powder		anionic	Water-soluble. Used in textile, metal cleaning, rubber, shampoos.
Intramine Y	Synthetic Chemicals, Inc.	Sod. salt of sulfated lorol and myristyl collamide	Detergent Wetting	Powder		anionic	Water-soluble. Used in textile, metal cleaning, rubber, shampoos.
Invadine B	Ciba Co.	Alkyl phenylene sod. sulfonate	Wetting				Use: Textiles (for bleaching and carbonizing).
Invadine C	Ciba Co.	Alkyl naphthalene sulfonic acid	Wetting				Very acid stable. Wool carbonizing.
Invadine D	Ciba Co.		Wetting Dispersing	Powder			Textile; dye levelling, particularly with acid or chrome dyes.
Isothan Q-15	Onyx Oil & Chemical Co.	Lauryl isoquinolinium bromide	Fungicide				Agricultural fungicide.
Janusol	Synthetic Chemicals, Inc.	Mixture of lauryl and myristyl esters containing both primary amino and sulfated groups	Dispersing	Powder		nonionic	Stable in alkaline solutions peroxide and hypochlorite. Use: Textile, rubber, pigment.
Joy (Retail)	Procter & Gamble Co.		Detergent	Liquid			Liquid dishwashing compound. See also Glim.
Kamenol D	Kamen Soap Products Co.	Alkyl aryl sod. sulfonate	Detergent	Powder	40%	anionic	General detergent for household use.
Kamenol S-11	Kamen Soap Products Co.	Alkyl aryl sod. sulfonate	Detergent Emulsifier	Paste	20%	anionic	General cleaning agent. Emulsifier for insecticides.
Kemulsion Base AA CC, D, PN	Kem Products Co.	Probably the fatty acid ester of a poly alcohol	Wetting Emulsion	Liquid		nonionic	These emulsifiers are designed for the following uses: AA, cosmetics; CC for coal tar disinfectants, D for DDT in Xylol, and PN for pine oil disinfectants.
Katapol K Conc.	General Dyestuff Corp.	Salt of polyethylene ether of a fatty amine	Detergent	Powder	20%	cationic	Neutral or acid wool scouring agent.
K-100	Up-State Chemical Co.	Amine condensation product	Detergent	Liquid	100%	nonionic	Formerly known as KF-100.
Kiersist	Alrose Chemical Co.		Detergent	Paste		anionic	Textile; kier boiling.
Kreelon 4D	Wyandotte Chemicals Co.	Alkyl aryl sod. sulfonate	Detergent	Flake	40%	anionic	Conforms to alkyl aryl type detergent in detergent and wetting properties.
Kreelon 4G	Wyandotte Chemicals Co.	Same as Kreelon 4D	Detergent	Powder	40%	anionic	Same as Kreelon 4D in spray dried form.
Kreelon 7D	Wyandotte Chemicals Co.	Alkyl aryl sod. sulfonate	Detergent	Flake	65%	anionic	Same as Kreelon 4D in more concentrated form.
L-6	Gallowhur Chemicals Co.		Wetting Detergent	Liquid		nonionic	General detergent for household use; rug shampooing, dishwashing, floor cleansers, etc.
Lamepon (German)		Acid amide of oleic acid and polypeptide from glue degradation	Detergent				See Maypon also and compare.
Lanamine	Robinson, Wagner Co.	A substituted alkylamine of selected lanolic acids	Detergent	Paste	100%	anionic	A high lathering detergent for cosmetics, particularly shampoos. A hair conditioning agent.
Lanitol F	Arkansas Co.	Alkyl aryl sod. sulfonate	Detergent Wetting	Flake Powder	40%	anionic	Textile; all operations.
Lanitol P*, S*	Arkansas Co.						
Lensex (English)	Shell Petroleum Co. (London England)	Sod. salt of secondary alcohol sulfate $\begin{matrix} R \\ R' \end{matrix}\!\!>\!CHOSO_3Na$	Detergent	Paste	44%	anionic	Paste form of Teepol, and similar to Teepex.
Leonil C (German)		Dodecyl alcohol condensed with ethylene oxide	Detergent			nonionic	See also Brij.
Leonil FFO (German)		Beta naphthol condensed with C_{6-8} olefine and the product condensed with 7-8 moles of ethylene oxide	Wetting	Liquid		nonionic	FFO= fat free Leonil O. A substitute for Leonil O when fat is scarce.
Leonil-O Solution	General Dyestuff Corp.	A fatty alcohol condensed with 15-20 moles of ethylene oxide	Acid Degreasing	Liquid	33%	nonionic	See also Brij and Leonil C. Textiles; wool washing.
Leonil SA	General Dyestuff Corp.	Dibutyl naphthalene sod. sulfonate	Wetting	Powder	80%	anionic	See Nekal BX.

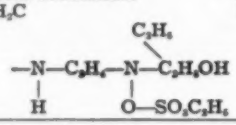
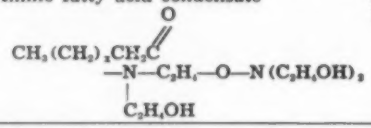
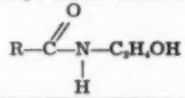
* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Leukotrop W (German)		Quaternary salt from disulfobenzyl chloride and dimethyl aniline	Germicide			cationic	
Lightning Penetrator XW	Commonwealth Color and Chemical Co.	Salt of a sulfated higher alcohol	Wetting Penetrant				Textile.
Lipal 450	E. F. Drew & Co.	A fatty acid ester of a poly ether alcohol	Wetting Foaming	Liquid	98%	nonionic	Useful for wetting where salt content is high.
Lissapol C (English) (A)	Imperial Chem. Ind.	Oleyl sod. sulfate	Detergent	Paste		anionic	American counterpart—Duponol LS, Orvus ES etc. Lissapol A is the cetyl derivative.
Lissapol LS (English)	Imperial Chem. Ind.	Sod. oleyl p-anisidine sulfonate	Detergent Dispersant	Paste		anionic	Effective lime soap dispersant. Uses: Textile, laundering, etc.
Lissapol N (English)	Imperial Chem. Ind.	Possibly an alkyl phenol ethylene oxide condensate	Detergent Wetting	Liquid		nonionic	Compare to Igepal CA, etc.
Lomar PW	Jacques Wolf & Co.	Sod. salt of a condensed naphthalene sulfonate	Dispersing	Liquid	80%	anionic	Formerly named Ramol (spelled backwards). Dispersant for pigments in cement, ceramics, paper, etc. Compare also Daxad, Darvan, Tamol P, etc.
Lorol Sulfate, Triethanolamine Salt	Onyx Oil & Chemical Co.	As in name	Detergent	Paste	84%	anionic	Similar in type to Duponol WAT. A shampoo base.
Lorridol	Beacon Co.		Detergent	Liquid			Very water soluble, (36%). Uses: Textiles, cosmetics, leather, etc.
Lupomin	Jacques Wolf & Co.	Alkyl olamide	Emulsifier Penetrant	Paste Powder		cationic	Very water soluble. Insol. in mineral oil and kerosene. Use: Textile softening agent.
Mapro Degum	Onyx Oil & Chemical Co.	Sulfated fatty alcohol blend	Detergent				Textile processing.
Maprofix	Onyx Oil & Chemical Co.	Sulfated fatty alcohol blend	Detergent				Textile processing.
Maprofix NEU	Onyx Oil & Chemical Co.	Technical sod. lauryl sulfate	Detergent	Powder	50%	anionic	Textiles, household and industrial cleaning. See also Duponol WA, Orvus, etc.
Mapromin B*	Onyx Oil & Chemical Co.						Discontinued.
Mapromol HSY	Onyx Oil & Chemical Co.	Sulfated oleyl alcohol	Wetting				Textile finishing.
Mapon AL #2	Maywood Chemical Co.	Ammonium salt of a protein condensate with lauryl chloride	Wetting Detergent	Paste	65%	anionic	
Maypon 4C	Maywood Chemical Co.	A protein condensation product with oleyl chloride	Detergent Wetting Emulsifying	Liquid	35%	anionic	A lathering shampoo base. See also Lamepon (German). For Mfg.—See Fiat Report 1141 P. 69.
Maypon K	Maywood Chemical Co.	A protein condensation product with oleyl chloride	Detergent Wetting	Liquid	37%	anionic	Dyeing and bleaching assistant for textiles. Emulsifying agent for insecticides.
Maypon SK	Maywood Chemical Co.	A protein condensation product with a fatty chloride	Emulsifying Detergent	Liquid	42%	anionic	Scouring agent. Good detergency.
Maypon OW (OWS)	Maywood Chemical Co.	Triethanolamine salt of Maypon K	Emulsifier	Paste	90%	anionic	Oil and water soluble. Emulsifier for DDT, etc. Maypon OWS is 45% active in strength, solvent diluted.
Maypon Powder	Maywood Chemical Co.	Maypon K with filler	Detergent Wetting	Powder	45%	anionic	A product containing an inert filler such as kieselguhr.
Medialan A (German)		Oleic acid amide of the sod. salt of sarcosine RCON $(CH_3)CH_2COONa$		Paste	64%	anionic	No known American counterpart.
Mercaid	Alrose Chemical Co.						Used primarily as a wetting agent for strong caustic solutions. Textiles.
Mercerol	Sandoz Chemical Wks.						Textiles.
Mercol ST	Distributed by Riches-Nelson, Theobold Industries, etc.	Poly alkylated benzene sod. sulfonate	Detergent Wetting	Powder	40%	anionic	Same as Sandev Detergex Beads. Built powder containing phosphates for household use.
Merpentine	E. I. du Pont de Nemours & Co.	Modified alkyl naphthalene sulfonate	Wetting	Liquid		anionic	Textiles; dyeing assistant.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Merpol B	E. I. du Pont de Nemours & Co.	Modified alcohol sulfate plus solvent	Penetrant	Liquid		anionic	Textile scouring and levelling agent.
Merpol C	E. I. du Pont de Nemours & Co.	Sod. alcohol sulfate plus solvent	Penetrant	Liquid		anionic	Textile scouring and levelling agent. Higher solvent content than Merpol B and a slightly superior wetting agent in hard, acid or alkaline solutions.
Mersolate (German)		Alkyl sod. sulfonate approx. $CH_3(CH_2)_{15}SO_3Na$				anionic	Most widely used German detergent during war. Contains disulfonates. An inferior product was available at time. Made by alkali hydrolysis of sulfo chlorinated olefines, chiefly from the Fischer Tropsch synthesis. For American counterpart see MP-189.
Mesamid H (German)					10%	anionic	The amide of Mersol H. Contains all the unreacted olefine plus 10% dimepasin sulfimide.
Methyl Decab*	Rhodes Chemical Co.	Alkyl trimethyl ammonium bromide	Germicide	Powder	100%	cationic	
Michelene DCA	M. Michel and Co.	Alkyl amido sulfate $CH_3(CH_2)_xCH_2C(=O)-N(H)-C_2H_4OSO_3Na$	Detergent	Powder		anionic	Textile wet processing.
Michelene DMA	M. Michel and Co.	Alkyl amido sulfate and alkyl aryl sulfonate $CH_3(CH_2)_xCH_2C(=O)-N(H)-C_2H_4OSO_3Na$ and $CH_3(CH_2)_{11}-C_6H_4-SO_3Na$	Detergent Emulsifier	Powder		anionic	Textile wet processing; compounding of household, dairy, farm specialties.
Michelene D-2 (D-1)	M. Michel and Co.	Alkyl amido sulfate $CH_3(CH_2)_xCH_2C(=O)-N(H)-C_2H_4OSO_3Na$	Detergent	Paste		anionic	Textile wet processing. D-1, modified slightly.
Michelene DLC (DAS)	M. Michel and Co.	Alkyl aryl sulfonate and alkyl amido alcohol $CH_3(CH_2)_{11}-C_6H_4-SO_3Na$ and $CH_3(CH_2)_xCH_2C(=O)-N(C_2H_4OH)-C_2H_4-O-N(C_2H_4OH)_2$ empirical	Detergent Wetting	Liquid		anionic	Textile wet processing, cosmetics, and household cleaners. Michelene DAS is a concentrated form of the DLC.
Michelene DS	M. Michel and Co.	Alkyl amido alcohol $R-C(=O)-N(H)-C_2H_4OH$	Emulsifier Wetting	Liquid		nonionic	Textile wet processing, cosmetics, wool spinning, lubricant.
Michelene DR (DRL)	M. Michel and Co.	Alkyl amino sulfate $CH_3(CH_2)_4CH=CH(CH_2)_xC(=O)-N(H)-C_2H_4-OSO_3Na$	Dispersant Leveler	Liquid		anionic	Textile wet processing. Michelene DRL is a modified form to increase storage life.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Michelene DLF	M. Michel and Co.	Modified alkyl aryl sulfonate	Wetter Foamer	Liquid		anionic	Textile wet processing, car washing.
Michelene DLD	M. Michel and Co.	Fatty acid amide ester	Dispersant Leveler	Liquid		nonionic	Textile dyeing.
Michelene DNI	M. Michel and Co.	Ethylene oxide condensate	Detergent Dispersant Emulsifier	Liquid		nonionic	Non-electrolytic leveling.
Michelene W	M. Michel and Co.	Alkyl naphthalene sulfonate $C_{10}H_6(C_2H_7)_2SO_3Na$	Wetter Penetrant	Paste		anionic	Textile wet processing, metal processing.
Michelene #10 (#15)	M. Michel and Co.	Diamine fatty acid condensate $CH_3(CH_2)_xCH_2C$ 	Softener Finish	Paste		cationic	Textile finishing. Michelene #15 is a refined grade of the #10.
Michelene #30	M. Michel and Co.	Amine fatty acid condensate 	Softener Plasticizer	Paste		nonionic	Textile finishing.
Michelene MA-4 (MA-8)	M. Michel and Co.	Alkyl aryl sulfonate	Detergent Wetting	Flake		anionic	Textile wet processing, and general compounding. Michelene MA-8 is a concentrated form of Michelene MA-4.
Michelene Tric (Tric-2)	M. Michel and Co.	Alkyl amido alcohol 	Emulsifier Wetter Foamer	Liquid		nonionic	Cosmetic formulations. Michelene Tric-2 is the same as Tric modified to a neutral pH.
Miragene S. Conc.	Miranol Chemical Co.	Fatty acid amide ether	Detergent	Liquid	40%	nonionic	Similar to Miragene T Liquid conc. except in organic solvent.
Miragene T Liquid Powder	Miranol Chemical Co.	Fatty acid amide ether	Detergent	Liquid	40%	nonionic	An aqueous solution. Good foam, salt free. Miragene T powder is 18% active.
Miragene T	Miranol Chemical Co.	Fatty acid amide ether	Detergent	Powder	18%	nonionic	18% active, balance carbonates.
Miranol CL Conc.	Miranol Chemical Co.	Sulfonated fatty acid derivatives	Detergent Wetting	Liquid	42%	anionic	Used for general cleaners.
Miranol LF Liquid Conc.	Miranol Chemical Co.	A polyamine derivative of a sulfonated fatty acid amide	Detergent Wetting	Liquid	42%	anionic	Cosmetics, bubble bath, shampoo. A super clear grade is also available.
Miranol LF Conc. Powder	Miranol Chemical Co.	Sulfonated fatty acid amide	Detergent	Powder	42%	anionic	pH of 1% sol. 7.8, non-toxic.
Miranol OH	Miranol Chemical Co.	Modified lauroyl imidazolene hydroxy acetate	Detergent Wetting	Liquid	45%	cationic	Thickener for soap solutions, silver polishes, rug shampoos.
Miranol QCK	Miranol Chemical Co.	Modified lauroyl imidazolene hydroxy carbonate	Wetting	Powder	27%	cationic	Non-toxic, cationic, dishwashing, ore flotation, textile dyeing.
Miranol SS	Miranol Chemical Co.	Sulfonated fatty acid amide	Detergent	Powder	18%	anionic	Uses: General industrial and household cleaners, cosmetics, textile, paper mills.
Miranol T	Miranol Chemical Co.	Sulfonated fatty amide plus an alkyl aryl sulfonate	Detergent	Powder	25%	anionic	A spray dried product similar to Miranol 45 and XSD but with a larger bead.

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Miranol T Conc.	Miranol Chemical Co.	Sulfonated fatty acid amide, plus an alkyl aryl sulfonate	Detergent	Powder	35%	anionic	A heavy duty detergent superior in this respect to the others of the series. Formerly Miranol XSD.
Miranol 45*	Miranol Chemical Co.						Discontinued.
Miranol 74*	Miranol Chemical Co.						Discontinued.
Mirapon RK Conc.	Miranol Chemical Co.	Sulfonated fatty acid amide, plus an alkyl aryl sulfonate	Detergent Wetting	Liquid	42%	anionic	pH of 1% sol. 7.8, non-toxic, very water-soluble.
Modinal*	E. I. du Pont de Nemours & Co.						Old name for Duponol D.
Monolaurate of Poly ethylene glycol	Various	As in name	Emulsifier			nonionic	Water dispersible. Uses: Cosmetics, detergents, insecticides.
Monosulph	Nopco Chemical Co.	Highly sulfonated castor oil	Penetrant Emulsifying	Liquid	68%	anionic	Textile dyeing assistant.
Morcowet 446-C	Morton Chemical Co.		Wetting Dispersing	Liquid		anionic	A dispersant for dyes, pigments. Also as mildew and mold agent.
Morcowet 469	Morton Chemical Co.	Alkyl naphthalene sulfonate	Wetting	Liquid		anionic	Textile.
Morlac*	Westvaco Chem. Div. Food Mach. Corp.						Discontinued.
Morpheloil X-479	Morton Chemical Co.	Sulfonic acid	Wetting	Liquid		anionic	Textile acid dyeing, etc.
Morpeloil X-508	Morton Chemical Co.	Sulfonic acid	Wetting	Liquid		anionic	Textile acid dyeing, etc.
Morpeltex AG	Morton Chemical Co.	A substituted fatty acid amide sulfonate	Detergent	Paste		anionic	Textile, scouring, softening agent. Very stable.
Morpeltex PM	Morton Chemical Co.	Alkyl naphthalene sulfonate plus amino condensation products	Wetting Detergent	Liquid		anionic	Textile scouring. Wet dry cleaning.
Morpeltex 498	Morton Chemical Co.	Alkyl naphthalene sulfonate plus amino condensation products	Wetting Detergent	Liquid		anionic	Textiles.
Morpelwet Z	Morton Chemical Co.	Aliphatic ester sulfate	Wetting	Liquid		nonionic	Textile, rewetting, softening, dye assistant.
Moytol	Standard Chemical Products Co.	Alkyl aryl sod. sulfonate	Wetting			anionic	Textile.
MP-189	E. I. du Pont de Nemours & Co.	Hcb. sulfonate	Detergent Wetting	Powder		anionic	Cream colored powder.
MP-189S	E. I. du Pont de Nemours & Co.	Hcb. sulfonate	Detergent Wetting	Liquid		anionic	Same as MP-189 only in liquid form.
MP-646S*	E. I. du Pont de Nemours & Co.						
Mulsor	Synthetic Chemicals, Inc.	Long chain fatty acid ester containing multiple ether linkages	Emulsifier	Liquid		nonionic	Soluble in mineral oil, kerosene and chlorinated hydrocarbons. Uses: Preparation of soluble cutting oils, etc.
Myrj-45	Atlas Powder Co.	Polyoxy ethylene stearate	Emulsifier Wetting	Solid	100%	nonionic	Oil in water emulsifier. Use: Foods, reduces viscosity in starch.
N-25*, N-100*	E. F. Houghton and Co.				100%	anionic	Same as N-25 (discontinued) except 100% active.
Naccolene F	National Aniline Division Allied Chemical & Dye Corp.	Modified alkyl aryl sulfonate	Detergent	Liquid		anionic	Similar to Nacconol NR but more soluble to organic solvents.
Nacconol EP	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Wetting			anionic	Special for electroplating baths.
Nacconol F	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent Dispersing	Solid		anionic	Detergent for use in organic solvents.
Nacconol FSNO	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent			anionic	Low taste for cosmetic or personal use.
Nacconol HG	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent	Flake		anionic	Used in salt water soaps, alkaline mixtures and foaming composition.
Nacconol LAL	National Aniline Division Allied Chemical & Dye Corp.	Sod. lorol sulfoacetate	Detergent	powder		anionic	A concentrate for use in dentifrices.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Nacconol NR	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent Wetting	Flake	40%	anionic	Water solubility, 5% at 15°C, 21% at 100°C. One of best alkyl aryl detergents. Side chain single and long. Surface tension of 0.15% and 25° 33 dynes/cm.
Nacconol NRCL	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent	Liquid	38%	anionic	In development stage.
Nacconol NRNO*	National Aniline Division Allied Chemical & Dye Corp.						Discontinued.
Nacconol NRSF	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent Wetting	Flake	90%	anionic	
Nacconol SSO	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sulfonate	Detergent	Flake	100%	anionic	In development stage.
Naccosol A	National Aniline Division Allied Chemical & Dye Corp.	Sod. alkyl naphthalene sulfonate	Hydrotrope	Flake		anionic	Solubilizing agent.
Naccosol—O	National Aniline Division, Allied Chemical & Dye Corp.	Alkylsulfoacetate (Alkyl approx. C_8)	Hydrotrope	Flake		anionic	Shampoos, etc. A solubilizing agent for Nacconol LAL, etc.
Naccotan A	National Aniline Division Allied Chemical & Dye Corp.	Alkyl aryl sod. sulfonate	Dispersing	Flake		anionic	Very water soluble, used in tanning chrome leather and for dispersion of solids and tars.
Naxonate G	Wyandotte Chemicals Corp.	Xylene sod. sulfonate	Hydrotrope Penetrating	Flake	95%	anionic	Useful in extraction due to hydrotropic properties.
Naxonate 4L	Wyandotte Chemicals Corp.	Aqueous sol. of xylene sod. sulfonate	Hydrotrope Penetrating	Liquid	40%	anionic	Useful in extraction due to hydrotropic properties.
Negamine 142A	Synthetic Chemicals, Inc.	Amine ester of a long chain fatty acid	Wetting Emulsifying	Liquid	50%	cationic	
Nekal A	General Dyestuff Corp.	Sod. alkyl naphthalene sulfonate	Wetting Emulsifying	Powder	70%	anionic	Textiles, paints. The alkyl group averages C_{16}.
Nekal BX High Conc.	General Dyestuff Corp.	Isobutyl naphthalene sod. sulfonate	Wetting Emulsifying Penetrant	Powder	80%	anionic	Like Santomerse No. 1, has some effect on checking mold growth on textiles. Very stable, particularly to H_2O_2, $CaClO_2$, etc.
Neomerpin	E. I. du Pont de Nemours & Co.	Derivative of alkyl naphthalene sulfonate	Wetting Emulsifying	Liquid		anionic	Very water-soluble. Stable to weak acids and alkalis.
Neomerpin N	E. I. du Pont de Nemours & Co.	Alkylated naphthalene sulfonic acid	Wetting	Liquid		anionic	Textile; dyeing, carbonizing. Leather; tanning.
Neopen SS*	E. I. du Pont de Nemours & Co.						
Neopone R	Ultra Chem. Works	Ethylene oxide fatty acid condensate	Wetting Dispersing	Liquid	100%	nonionic	Textiles, as scouring agent, leather, etc.
Neutronyx 330	Onyx Oil & Chemical Co.	Poly alkyl ether condensate of fatty acids	Dispersing Emulsifying	Liquid	95%	nonionic	Cosmetics, salt water soap, etc.
Neutronyx 331.-2,-3	Onyx Oil & Chemical Co.	Poly alkyl ether condensate of fatty acids	Detergent Emulsifying		98%	nonionic	Cosmetics, insecticides, general cleaners.
Neutronyx 600	Onyx Oil & Chemical Co.	Aromatic poly glycol ether condensate	Detergent Wetting	Liquid	100%	nonionic	General purpose detergent; for industrial and home uses.
Neutronyx 834	Onyx Oil & Chemical Co.	Fatty acid ester of a poly ether alcohol	Emulsifying	Liquid		nonionic	Water dispersible. Oil in water emulsifier.
Ninol 200	Ninol Laboratories	Mixed fatty acid alkanolamine	Detergent Wetting	Liquid	33%	anionic	Textiles, laundering.
Ninol 400	Ninol Laboratories	Mixed fatty acid alkanolamine	Detergent Wetting	Liquid	100%	nonionic	Textiles, laundering.
Ninol 737	Ninol Laboratories	Mixed fatty acid alkanolamine	Detergent Wetting	Liquid	100%	nonionic	Textiles, laundering, fur cleaning, etc.
Ninol 2019	Ninol Laboratories	Mixed fatty acid alkanolamine condensate	Wetting Emulsifying	Liquid	90%	nonionic	Oil in water emulsifier. Uses: shampoos, etc.

* Discontinued

Trade Name	Manufacturer	Class and Formula	Main Uses	Form	% Conc.	Type	Remarks
Nionine PG	Amalgamated Chemical Corp.	Polyethylene glycol ester	Emulsifier Wetting	Liquid	25%	nonionic	Textile. pH of 1% soln. 6.5.
NNO	Atlas Powder Co.	Hexitan partial fatty acid ester of lauric acid	Emulsifying	Liquid		nonionic	A coconut oil derivative. Similar to Span 20, except containing glycerides.
Nonic 218	Sharples Chemicals, Inc.	Polyethylene glycol tertdodecyl thio-ether	Detergent Wetting	Liquid	95%	nonionic	Formerly known as Nyon 218 and Non-ionic 218. Stable to alkali. Not stable to strong acids or oxidizing agents.
Nonisol 100	Alrose Chemical Co.	A polyethylene glycol of lauric acid (Glycol-400)	Wetting Emulsifying	Liquid	100%	nonionic	Water soluble. Insoluble in kerosene and xylene. Uses: Cosmetics as emulsifier, thickening agent; Textiles, hand cleaners, etc.
Nonisol 110	Alrose Chemical Co.	A polyethylene glycol of lauric acid (Glycol-400 plus 600 possibly)	Wetting Emulsifying	Liquid	100%	nonionic	Similar to 100 with glycol (600) probably replacing the 400 in part. Soluble in xylene. Uses: Coning oil and also as a fat emulsifier.
Nonisol 150	Alrose Chemical Co.	A polyethylene glycol (1000) ester of lauric acid	Emulsifier	Paste	100%	nonionic	Similar to Nonisol 100 and 110 in general properties. A solubilizing agent for vitamins, sterols, etc.
Nonisol 200	Alrose Chemical Co.	A polyethylene glycol (400) ester of oleic acid	Wetting Emulsifying	Liquid	100%	nonionic	Water dispersible, soluble in most organic solvents. Insoluble in kerosene. Emulsifier for kerosene. Use cosmetics, insecticidal sprays, etc.
Nonisol 210	Alrose Chemical Co.	A polyethylene glycol ester of oleic acid (Possibly a mixture of Glycol 400 and 600)	Emulsifying		100%	nonionic	Soluble in kerosene. For uses see manufacturer's data.
Nonisol 250	Alrose Chemical Co.	A polyethylene glycol (1000) ester of oleic acid	Solubilizing Hydrotrope	Paste	100%	nonionic	Similar to Nonisol 150 with oleic replacing lauric. A solubilizing agent.
Nonisol 300	Alrose Chemical Co.	A polyethylene glycol (400) ester of stearic acid	Emulsifying Wetting	Paste	100%	nonionic	M. P. 30°C. Soluble in xylene, dispersible in water, insoluble in kerosene. A starch stabilizer.
Nonisol 310	Alrose Chemical Co.	A polyethylene glycol ester of stearic acid (Possibly the 400 and 600 glycol is used)	Emulsifying Wetting	Paste	100%	nonionic	Similar to Nonisol 110 with stearic replacing lauric. Soluble in kerosene above 30°C.
Nonisol 350	Alrose Chemical Co.	A polyethylene glycol (1000) ester of stearic acid	Emulsifying	Solid	100%	nonionic	Similar to Nonisol 150 with stearic replacing lauric. An emulsifying and thickening agent.
Nopacol 4-AL	Nopco Chemical Co.	Ethylene oxide condensate of a fatty nucleus	Emulsifying	Liquid	100%	nonionic	Formerly Nopalcol 4-L. Uses: Textiles, rubber, leather.
Nopalcol 6-O	Nopco Chemical Co.	Ethylene oxide condensate of a fatty nucleus	Emulsifying	Liquid	100%	nonionic	Uses: Textiles, metal treating.
Nopalcol 10-DL	Nopco Chemical Co.	Ethylene oxide condensate of a fatty nucleus	Emulsifying	Paste	100%	nonionic	Soluble in water and many organic solvents. Used as solvent/water emulsifier. Emulsifier for plasticizers.
Nopco 1067	Nopco Chemical Co.	Alkyl aryl sod. sulfonate	Detergent	Paste	22%	anionic	Soluble in water, insoluble in benzene, kerosene, etc. Uses: Textiles, leather, paper, metal cleaning, etc.
Nopco 1068-X	Nopco Chemical Co.	Alkyl aryl sod. sulfonate	Detergent Wetting	Flake	32%	anionic	Stable to acids, alkalis. Not too stable to hard water. Uses: Textiles, metals, etc.
Nopco 1087-X	Nopco Chemical Co.	Alkyl aryl sod. sulfonate	Wetting	Paste	30%	anionic	Soluble in water, slightly soluble in kerosene. Uses: Textiles, leather, paper.
Nopco 1179-R	Nopco Chemical Co.	Fatty amino compound	Detergent	Liquid	30%	anionic	Very water soluble. Insoluble in kerosene. Uses: Textiles, leather, paper.
Nopco 1219-A	Nopco Chemical Co.	Fatty amino compound	Emulsifying	Liquid	100%	nonionic	Designed for chlordane emulsification. Soluble in xylene and petroleum products.
Nopco 1285	Nopco Chemical Co.	Sulfated fatty ester	Penetrant	Liquid	65%	anionic	Textile; dyeing assistant.
Nopco 1408	Nopco Chemical Co.	Sulfated castor oil soap	Emulsifying Penetrant	Liquid	45%	anionic	Cosmetics, as foaming agent in shampoos, also in textiles as vat dye assistant.

To be concluded

we can't say we know all the answers...

but we know we have soap-selling scents!

Nobody—well, almost nobody—knows why one good odor in soap appeals to more people than another good odor. But we do know, through years of experience in blending and selling, which odors have the widest appeal. Drawing upon this research and experience, we have developed a number of distinctive compositions especially designed to captivate the soap-buying public. These compositions are ready for incorporation in your finished product. You can depend on their stability, odor strength and tenacity.

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TRADE NEWS

New Iowa Soap Sales Heads

Ray I. Horton, for 22 years a sales supervisor for Procter & Gamble Co., Cincinnati, has been appointed sales manager of Iowa Soap Co., Burlington, Ia., it was announced recently by J. F. Hodson, vice-president. Mr. Horton succeeds L. J. Evans, who resigned from the company recently. In his new capacity, Mr. Horton will direct all sales activities in the retail field.

Kenneth J. Campbell has been named assistant sales manager. He was formerly with Procter & Gamble Co., having served as a salesman in the middle west area for 15 years. Mr. Campbell will spend much of his time in the various sales territories of the Iowa Soap Co. in directing its sales program. Both he and Mr. Horton will make their headquarters in Burlington.

AASGP Meets Jan. 25-26

The 23rd annual convention of the Association of American Soap & Glycerine Producers, Inc., New York, will be held Wednesday and Thursday, Jan. 25-26, 1950, at the Hotel Plaza, New York. In general, the meeting will follow the pattern of the 1949 gathering, except that instead of simultaneous sessions of various groups it is hoped that group meetings can be held on a non-conflicting basis to give attendants an opportunity to sit in on all sessions. John O. Brownell of Lever Brothers Co., Cambridge, Mass., has been named chairman of the convention committee to succeed James Reilly of Colgate-Palmolive-Peet Co., Jersey City, N. J., who has been chairman for the past two years.

Named to New Lever Post

Louis F. Watermulder, for the past seven years treasurer of Quaker Oats Co., Chicago, was recently appointed as administrative vice-president of Lever Brothers Co., Cambridge, Mass. In this newly created post he will supervise and coordinate the activities of the director of personnel and

LOUIS F. WATERMULDER

public relations, the treasurer, and the secretary and general counsel.

He is a graduate of Yale University where he was editor of the university's annual and was elected to Phi Beta Kappa. He took postgraduate courses in law.

Benjamin Harrison Dies

Benjamin Harrison, 84, a salesman for Colgate-Palmolive-Peet Co., Jersey City, N. J., for 35 years, died Aug. 4 at Riverview Rest Nursing Home, Whippany, N. J. He is survived by a daughter, Mrs. John R. Riker of Morris Plains, N. J.

Kracke Active in Reserve

John L. Kracke, sales manager for Swift & Co.'s soap division, spent considerable time this past summer at Camp McCloy, Wis., where, as a lieutenant colonel in the Army Officers Reserve Corps, he conducted a tank school for the 33rd division, Illinois National Guard during its annual summer encampment. During the war Col. Kracke commanded the 32nd squadron of the 14th cavalry group (mechanized) which met the spearhead of Field Marshal von Runstedt's attack in the Battle of the Bulge.

Babbitt Profit Down

B. T. Babbitt, Inc., New York, recently reported a net income for the first six months of 1949 of $792,747, or 77 cents a share, which represents a decline from earnings of $1,109,124, equal to $1.08 a share in the first half of 1948. Reason for the drop was given as heavy promotional expenses. Sales for the 1949 half were a record net of $9,230,407, against $8,225,159 for last year's first half. Babbitt's second quarter profit totaled $229,654, equal to 22 cents a share, as compared with $483,291, or 47 cents, for the second quarter last year. Sales in the second three months of 1949 were reported as $4,157,983, against $3,990,937.

C. L. Huisking in Brazil

Charles L. Huisking, president of Conti Products Co., Brooklyn, and Charles L. Huisking & Co., New York, is currently in South America, where he is studying at first hand the menthol situation in Brazil. One of his first stops was to be Santos; later he was to go to Rio de Janeiro. Mr. Huisking is also investigating the possibility of exporting certain chemicals from the U. S. to Brazil.

Board Exonerates Lund

Charles Lund, head of the fats and oils export licensing division of the Office of International Trade, recently was cleared by a Government Board of Investigation on charges that he had given advance information of fats and oils quotas to a group of private traders. He admitted receiving Christmas gifts from private traders and will be placed on vacation two weeks without pay. The Department of Commerce has a rule that no employee can accept a gift from a private individual doing business in fields in which an employee is working, regardless of its value. The Board ex-

onerated him on the charges that he had "leaked" important information in advance of its release to the general public.

Stevens in Gen. Aniline Post

Dr. Chapin E. Stevens, previously engaged in research on surface active agents for six years at the Central Research Laboratory of General Aniline & Film Corp., Easton, Pa., recently joined the central sales development department of the company, also located at Easton.

DCAT to Hear Cullen

Dr. Frederick J. Cullen, executive vice-president of the Proprietary Association of America, will be the feature speaker at the 59th annual meeting of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, to be held at Shawnee Inn, Shawnee-on-Delaware, Pa., Thursday and Friday, Sept. 22-23. He will speak on the subject of "Trends in Government." In his talk Dr. Cullen will discuss those activities of the Federal agencies affecting the chemical, drug and related industries. Section business will be transacted at the meeting, at which reports of officers and committee chairman will be read and the election of an executive committee will take place.

Aid Sales Executives

Soap makers and sanitation supply houses helped stimulate "on time" attendance by delegates at the various program sessions at the recent Chicago convention of the National Federation of Sales Executives. In the list of donors of door prizes appeared the following, with their contributions: Armour & Co., case of "Dial" soap; Culligan Zeolite Co., "Culmatic" water softener; Diversey Corp., three ivory plastic "Enoz" para packs; H. D. Hudson Mfg. Co., paint sprayer.

Gross Names Stark

The appointment of J. W. Stark Co., 804 New Center Building, Detroit 2, Mich., to represent A. Gross & Co., New York, on its full line of fatty acids in Michigan and the city of Toledo, O., was announced recently.

Sandberg Joins Pepsodent

John V. Sandberg, formerly advertising and sales promotion manager

JOHN B. SANDBERG

of Kraft Foods Co., Chicago, recently joined the Pepsodent Division of Lever Brothers Co., Chicago, as vice-president in charge of advertising. At one time he was assistant advertising manager for Swift & Co., Chicago. A graduate of the University of Illinois, Mr. Sandberg was also connected with the Chicago *Tribune*, a Chicago advertising agency and the National Broadcasting Co. He assumes his new post Sept. 15.

AASGP Board to Meet

A meeting of the board of directors of the Association of American Soap & Glycerine Producers will be held Thursday, Sept. 22, at the Ambassador East Hotel, Chicago.

Bon Ami Earnings Drop

Bon Ami Co., New York, reported a decline in its net profit during the first six months of 1949, as compared with the like period a year ago. Earnings for the first half of this year were put at $200,242 or five cents a share on Class B stock, as against $407,740 or $1.09 a share last year. Class A stock earned $2 per share, the same amount as in last year's first half. Gross profit from sales in 1949 amounted to $1,266,163, as against $1,287,374 in the like period in 1948. Depreciation and depletion were put at $42,375 this year, as compared with $38,761 in 1948. Income taxes totaled $135,838 this year; last year they were $246,203 in the first six months.

Bon Ami Co. had a net profit of $141,840 or 23 cents a Class B share in the first quarter of 1949, against $192,261 or 49 cents a Class B share in the first three months of 1948.

D&O Advances Dowling

Arthur L. Dowling has been appointed assistant secretary of Dodge & Olcott, Inc., New York, it was announced recently. Formerly assistant sales manager and advertising director, he joined the firm in 1946 after six years service as a lieutenant commander in the U. S. Navy. In addition to his other duties Mr. Dowling is editor of "D&O News," company house magazine, the first issue of which was published recently.

Gage Joins Jarrett

Horace A. Gage, formerly assistant vice-president in charge of sales for Wyandotte Chemicals Corp., Wyandotte, Mich., recently joined Cecil H. Jarrett & Co., Newton, N. C., as general manager and treasurer. He is a public accountant and has had several years experience in public and industrial accounting work. Cecil H. Jarrett Co. recently observed its sixth anniversary as a dealer in chemicals and supplies.

New Wetting Agent

Dearborn Chemical Co., Chicago, recently announced a new surface active agent, tetra-naphthenoyl triethylene tetramine. It is an acylation product of triethylene tetramine with naphthenic acid, a very high viscosity oil, dark in color, insoluble in water but soluble in a variety of organic solvents. It has an acid number of approximately 30. It is commercially available in technical grade.

A. R. Jensen Joins MM&R

Arthur R. Jensen, formerly general manager of Lag Drug Co., Chicago, recently joined the sales staff of the Chicago office of Magnus, Mabee & Reynard, Inc., New York. He will cover Wisconsin, Minnesota and North and South Dakota.

Soap Sales Rise in 2nd Quarter

DOMESTIC sales of soap for the second quarter of 1949 were larger than in the preceding three months, according to figures recently released by the Association of American Soap & Glycerine Producers, Inc., New York. The increase was reflected in both non-liquid and liquid soap totals.

In the April-June quarter, non-liquid soap sales amounted to 626,527,000 pounds, worth $114,785,000, as against 614,621,000 pounds, valued at $119,893,000 for the first quarter of 1949. The second quarter, 1948, total was 631,307,896 pounds, worth $144,624,000.

Liquid soap sales for the second quarter of this year amounted to 1,443,000 gallons, worth $1,647,000. In the first three months of 1949 liquid soap sales were reported as 1,331,000 gallons, valued at $1,515,000. Second quarter 1948 totals were 939,394 gallons, worth $1,260,971.

The above totals for both non-liquid and liquid soap sales are based on figures submitted by all companies participating. Comparative totals submitted by 56 manufacturers who have regularly supplied figures show a second quarter non-liquid volume of 607,569,000 pounds, worth $112,010,000, as compared with 600,127,000 pounds, valued at $117,758,000 for the first 1949 quarter. The second quarter totals for 1948 show 630,095,000 pounds, at $144,624,000.

Comparative liquid sales for the quarter ended June 30, 1949, were 700,000 gallons, worth $971,000, as against 666,000 gallons, valued at $877,000 in the first 1949 quarter. In the second 1948 period 643,000 gallons of liquid soap, worth $942,000, were reported.

Sales of synthetic detergents in the April-June quarter, 1949, were reported as 158,236,000 pounds by 31 companies. Value of second quarter synthetic detergent sales reported was $34,198,000. In the first quarter of this year sales of synthetics were reported as 154,871,000 pounds, at $34,257,000. The number of firms reporting on synthetic detergent sales rose from 26 in the first quarter to 31 for the second quarter.

Gillette Bill

seeks to classify soap as a cosmetic. Senator Gillette has introduced a bill (S. 2392) in the Senate which would have the effect of defining soap as a cosmetic and making it subject to the controls in the Federal Food, Drug and Cosmetic Act. At present soap is specifically exempted from the cosmetic definition in this Act. Mr. Gillette's bill would remove that exemption.

J. C. Allen in Atlas Post

J. Charles Allen recently became chief engineer of Atlas Powder Co., Wilmington, Del., succeeding J. W. Hanson, who has retired.

Corley Armour Chem. Head

H. M. Corley, for the past three years assistant director of research, was recently named manager of the chemical division of Armour & Co., Chicago. He succeeds Edward W. Freundt, who died while on vacation in Seattle, Wash., July 3.

Mr. Corley has been with the firm since 1927 and has devoted most of his work to the development of new chemicals, commercial processes for manufacturing chemicals and new products in which chemicals are used.

BIMS Hold Final Outing

The final golf outing of the season of the BIMS of New York was held at North Hempstead Country Club, Hempstead, L. I., N. Y., Aug. 25. It was a member-guest tournament. Low gross was won by Louis Bezard of Parfums Schiaparelli, Inc., while low net went to O. Dexter Neal, manufacturers' representative.

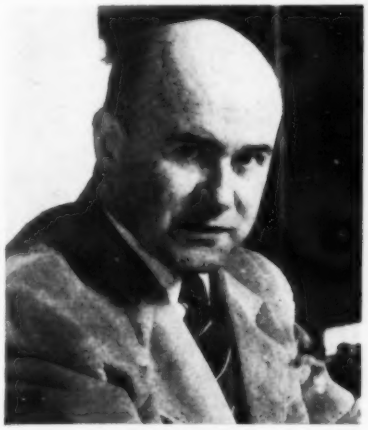
Winners of the July 26 affair at Winged Foot Country Club, Mamaroneck, N. Y., included A. D. Henderson, with a low gross of 76. Low nets were registered by Harry G. Griffiths of Pennsylvania Drug Co. and C. R. Keeley of Drug Markets, Inc.

Other prize winners were: Alec J. Dedrick of Van Amerigen-Haebler, Inc.; Arthur Greene; Al Graff; Robert A. Kramer, Evans Chemetics, Inc.; Pel Livsey; Harry W. Heister, George Lueders & Co.; Frank Higgins; James McInnes, Jr., Commercial Solvents Corp.; Joseph K. Kleinberger, Scholl Manufacturing Co.; George Welp, International Printing Ink division, Interchemical Corp.; Albert C. Burgund, Carr-Lowrey Glass Co.; Louis Bexard, Parfums Schiaparelli, Inc.; Walter S. Nuckols, Swindell Brothers; Walter A. Conklin, Wallace Paper Box Corp.; Paul A. Dunkel, Paul A. Dunkel & Co.; Frederick L. Butz, White Metal Manufacturing Co.

Available in paste form now is "Amion" ammoniated dentifrice. The powder product was introduced about a year ago. Package design for the tooth paste bears strong family resemblance to that of the powder. Both packages were designed by Robert Sidney Dickens & Associates, Chicago. "Amion," produced by J. B. Roerig & Co., Chicago, retails for 49 cents in paste form, 69 cents as a powder.

Form DeLaire Division

The formation of DeLaire Division of Dodge & Olcott, Inc., New York, with Henri Robert as director,



HENRI ROBERT

was announced recently by D. & O. and Fabriques DeLaire of Paris, manufacturers of aromatics and perfume specialties. Mr. Robert has also been named director of the DeLaire Research Laboratories in Paris. Dodge & Olcott has represented DeLaire in the U. S. for over 50 years. New laboratories have been built for the division.

Urges Rendering Research

The rendering industry should begin a vigorous research program now if its economic problems are to be met, W. L. Kubie, biochemist at the Armour Research Foundation of Illinois Institute of Technology, Chicago, wrote recently in the *Frontier*, the Foundation's technical magazine. Mr. Kubie surveyed new techniques developed in industries with which the rendering industry is closely allied and pointed out the need for improvement of fat extraction processes and other matters to keep pace with progress in those related fields.

"The situation in the soap industry is changing rapidly as synthetic detergents gain in popularity . . ." he states, adding, "so far the sale of synthetics has been superimposed on the increased sale of soap, but at some point it may be at the expense of soap. Many large soap companies, in recognition of this fact, have developed synthetic detergents of their own. Since mineral oil is the starting material for many of the detergents, it is interesting to speculate about what will happen to the tallow market as soap production falls off."

Continuous soap making methods require a much more refined starting material, particularly in regards to color, Mr. Kubie also points out. This, he says, will necessitate considerable upgrading of tallow.

"Most important for the renderer are new uses for his products. Superior detergents, made from fats, and materials for other products are possibilities which deserve investigation. A systematic research program would uncover these possibilities and lead to many valuable patents and economic advantages not now enjoyed by the rendering industry."

New Plastic Dish Cleaner

A new product, "Tannicide," for removing food stains from plastic dishes was announced recently by Detergent Products, Inc., Philadelphia. The new product is available in portion control units containing enough powder to make five gallons of solution. It comes packed in case of 18 and 72 units. Distribution is by local jobbers. The product is claimed to be especially effective in removing coffee and tea stains. It is said to contain no abrasives or chlorine.

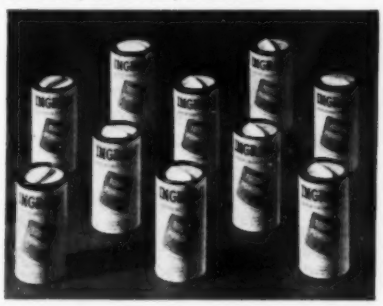
Diamond Men Advanced

Advancement of two key sales executives of Diamond Alkali Co., Cleveland, was announced recently. Earl J. Mills, manager of less-carload sales for Diamond at its Chicago sales office for the past two and one-half years, has been named manager of the company's southwestern sales district, which embraces the states of Texas, Oklahoma and Kansas.

Charles W. Klaus, manager of carload sales at Chicago since 1947, has been appointed to take complete charge of Diamond sales in the seven state area of Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin and Nebraska. He will continue to make his headquarters in Chicago.

Mr. Mills, who will work out of Houston, where Diamond has a $14,500,000 electrolytic chlorine-caustic soda plant, at one time was with Lever Brothers Co., Cambridge, Mass.

Below: Part of the half million individual miniature samples of new "Ingram" ammonium-ion tooth powder made by Bristol-Myers, Inc., New York. Sample is replica of larger over-the-counter package. "Leedpak" sampler, manufactured and distributed by Leeds Sales Co., New York, was used.



Above: New full-color lithographed cardboard jumble basket being used by Lambert Pharmacal Co., St. Louis, for current campaign for "Listerine" tooth paste as "Tobacco Mouth" deterrent. Einson-Freeman, Long Island City, N. Y., produced the display.

Tamms Silica Changes Name

To better reflect its expanded activities Tamms Silica Co., Chicago, recently announced a change in name. The company will henceforth be known as Tamms Industries, Inc. When the firm was incorporated in Illinois in 1911 the company's operation was limited exclusively to raw materials and the sale of silica. Since then its manufacturing operations have been diversified to include a number of other products.

Russell M. Held, who has been with the firm for over 13 years, was recently made a vice-president by action of the board of directors. He continues as manager and director of sales of the packaged goods department.

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FACTORY: *Clifton, N. J.*

There is not a soap product made whose sales will not respond to the subtle persuasion of a discreetly chosen fragrance. If you feel there is a lack of this powerful sales ingredient in any of your present products, it might well pay you to let our laboratory specialists venture a suggestion or two toward its improvement. And, of course, you will not be obligated unless you can see real possibility of benefit in our recommendations.

NYU Perfuming Course

A course in aromatics and perfume blending, conducted by Samuel Klein, perfumer in charge of research for Van Dyk and Co., Belleville, N. Y., will be given by the adult unit of New York University, Division of General Education, for 15 weeks beginning Sept. 26. Registration is limited to 20 students and applicants should have some basic experience with perfume oils. The course is intended for perfume users, salesmen, buyers and others in aromatics and perfumery industries. Purpose of the course is to give students ability in olfactory perception and discrimination and to instruct in the elements of perfume blending.

Dow Credit Mgr. Retires

L. A. Chichester retired recently as assistant secretary and general credit manager of Dow Chemical Co., Midland, Mich. He had been with the firm for 31 years. Succeeding Mr. Chichester is Robert B. Bennett, who has been appointed general credit manager. He has been with Dow since 1941, when he joined the firm as assistant credit manager. Because of his familiarity with many phases of the Dow operation, Mr. Chichester is being retained in the capacity of a consultant.

SOAP INVESTIGATION

(*From Page 36*)

ican fat production, he insisted, was due rather to the lack of dollar exchange abroad, and unwillingness to meet our relatively high price level.

GEORGE L. PARKHURST, president of Oronite Chemical Co., San Francisco, appeared before the committee on August 16. In commenting on the rather remarkable growth of the synthetic detergent industry over the past few years he observed that, had it not been for the war, we should have seen an even greater growth. The research background was present during the war years for an even greater growth than occurred. Then, when the war ended, there was this backlog of technological development ready for commercialization.

An important factor in the rise of synthetic detergents over the past few years, he said, has been the development of synthetics of the so-called heavy-duty type. While synthetics have been excellent for washing fine laundry, and for dish washing, the types available until recently were not highly effective in the washing of heavily soiled cottons. "Since the war," Mr. Parkhurst observed, "the major soap companies, in particular, have developed products which do a good job in the washing machine, so the synthetic detergent has for the first time entered that very large market."

Discussing formulation of synthetics, Mr. Parkhurst emphasized that there are a number of ingredients other than the pure active ingredient which are essential to the formulation of a satisfactory detergent, including sodium sulphate, carboxy methyl cellulose, etc. He answered in the negative to a question from Mr. Hadlick as to whether or not there was any law requiring labeling of soaps and detergents to indicate the percentage of active ingredient.

Discussing again the effect that the rise in synthetic sales has had upon the sale of tallow soaps, Mr. Parkhurst was in general agreement with previous witnesses that the rise in the entire detergent market, as compared with pre-synthetic figures, would not have been as great in the absence of the new synthetic detergents. His guess, he said, was that conventional soaps would have captured only about half of the new market which synthetics now hold. There are many cases, he pointed out, where synthetics will do a job which soap will simply not do. Synthetics have thus extended the overall detergent market. The advertising and merchandising campaigns behind synthetics, he testified, have also been an important factor in extending the market for all cleaning materials.

Another point touched on in Mr. Parkhurst's testimony was of specific interest. Synthetics, he predicted, "are not likely to be of any great importance in the bar soap field." Though the English are reported using synthetics in bar form, and though some American companies are naturally experimenting with such products, Mr. Parkhurst observed that "synthetics have not had a marked success in the bar form."

Schroeder in A-D-M Post

The appointment of Burton Schroeder as manager of fatty acid sales was announced recently by Archer-Daniels-Midland Co., Minneapolis. Previously he was in charge of the industrial cereal products division. He has been with the firm since 1939, except for wartime naval service. Mr. Schroeder's experience with A-D-M includes technical service and laboratory control work, marketing studies, and research in oils.

Dunkel Wins CSA Golf

Paul Dunkel of Paul A. Dunkel & Co., New York, and Eugene Herman shared the honors for low gross, Flight A, for members and guests, respectively, at the Aug. 16 golf outing of the Salesmen's Association of the American Chemical Industry, at Baltusrol Country Club, Springfield, N. J. R. W. Daniels of Calco Chemical Division, American Cynamid Co., Bound Brook, N. J., won low net in Flight A, while second low gross went to a guest, Arthur Mitchell. Another guest, R. W. Moister, took low net. In Flight B, Peter C. Reilly, Jr., of Reilly Tar & Chemical Co., Tuckahoe, N. Y., won low gross and James C. Chilcott of Maltine Co., New York, took low net in the same flight. Low gross and low net in Flight C were awarded, respectively, to Walker H. Junker of Commercial Solvents Corp. and Paul W. Hiller of Innis Speiden & Co., both New York. Kickers for members were won by J. K. Duffy, Joseph Turner Co., Ridgefield Park, N. J.; M. Resnick, N. Y. Laboratory Supply, New York; Arthur F. Smith, Westvaco Chemical Division, Food Machinery & Chemical Corp., New York; Harry D. Armitage, Emery Industries, New York, and Webster Rice, McKesson & Robbins, Inc., New York. Guest kickers were won by P. Bauer, Hollan Richards and James Watkins. Longest drive and nearest to the pin were taken by Wallace Suffern and Howard Rose, respectively, both guests. Four door prizes were also distributed.

New Oklahoma Soap Plant

Clinton Soap Co., Clinton, Okla., the state's first soap manufacturing plant began operations recently. The company is owned and operated by Thomas and Cleve Holt. While the concern is manufacturing powdered laundry soap at present, the owners are planning to expand their operations upon completion of a proposed $25,000 addition to their Custer County Rendering Co. plant. Until that time, the rendering company quarters will house the soap processing facilities. Soap making is an outgrowth of rendering operations at the Holt plant. Manufacturing began upon completion of the installation of a new kettle, which cost $10,000.

Soap Buying Guide

How to buy and use soaps and detergents is the subject of a new 24-page booklet recently issued by the Household Finance Corp., Chicago, as No. 16 in its Better Buymanship Series for housewives and home owners. The title, "Soap and Other Detergents," covers a completely revised edition of the Household Finance booklet on soap buying published several years ago. The new edition gives much practical information which the housewife may use both in buying and in using detergents. This latter edition is shorter and omits much technical data. Emphasis is placed on users reading and heeding manufacturers' label instructions. Altogether, this is an excellent brief treatise on the whys and wherefores in selecting and using detergents in the home. Edited by Helen Hounchell of Household Finance Consumer Education Department of which Leone Ann Heuer is director.

Expand Sulphonate Plant

Mineral Oil Refining Co., Dickinson, Texas, has announced a 35 per cent increase in its output of petroleum sulfonates for use in detergent, fat splitting, soluble cutting oil, textile and leather industries. The company has recently expanded its plant capacity and operations which also include production of other mineral oil specialties. Elgo Trading Corp., New York, of which Louis Geismar is head, is national sales representative for the company. The Texas firm was founded in 1941 by its present officers who formerly were associated with the Pennsylvania Refining Co., Butler, Pa., Kermit D. Wade, president; James L. Eisler, vice-president and general manager; S. Ward McCullough, secretary-treasurer.

New Armour Sales Office

The establishment of an eastern sales and technical service office for the chemical division of Armour & Co., Chicago, at 120 Broadway, New York, was announced recently. Ervin E. Segebrecht, formerly a member of the sales and technical department of the division's Chicago office, is in charge of the new branch.

Booklet on DCAT

The Drug, Chemical and Allied Trades Section of the New York Board of Trade recently issued a 24-page booklet describing its background, activities, services and listing its officers and membership.

P. & G. Shifts Dinsmore

Appointment of Campbell Dinsmore as sales manager for Procter & Gamble Co., Ltd., Toronto, Canada, was announced recently by officials of the parent company in Cincinnati. Mr. Dinsmore has been manager of the Cincinnati sales district for 17 years. Harry E. Faught, who succeeds Mr. Dinsmore at Cincinnati, joined P&G in 1937 in the advertising department and transferred to the sales department a short time later. He served in Cleveland and Chicago and more recently was a supervisor in the Chicago sales district.

Speel to Antara Products

Henry C. Speel, a development engineer with the central sales department of General Aniline & Film Corp., New York, was transferred recently to Anatara Products, where he will engage in sales work. A veteran of 20 years in the market development phase of the chemical industry, he has spent 15 years in the field of surface active agents.

P&G Earnings Decline

A decline in its net profit for the fiscal year ended June 30, 1949 was reported recently by Procter & Gamble Co., Cincinnati. The company had a net for the fiscal year of $28,655,481, equal to $4.44 per common stock share, after payment of preferred dividends. In the period ended June 30, 1948, Procter & Gamble had a net income of $65,418,688, worth $10.18 a common share. A transfer of $21,000,000 to unappropriated earned surplus from the reserve for inventory price decline was shown in the statement for the fiscal year just ended. The amount, added to the consolidated net profit, totaled $49,655,481 as the total transferred to unappropriated earned surplus for the year. Last year $23,000,000 was transferred to reserve for inventory price decline, making a total of $42,418,688 transferred to earned surplus for the previous fiscal year.

Sales in the year just ended totaled $696,670,926, as against $723,679,333 for the previous fiscal year. Income taxes for the fiscal year ended June 30, last, amounted to $16,163,450, as compared with $42,820,296 a year earlier.

Total assets of $294,302,623 were reported as of June 30, 1949, as against $316,387,623 on the comparable date a year earlier. The company's cash position improved during the last fiscal year, when $27,504,749 was shown in the report. A year ago the figure was $23,882,554.

Common dividends paid this year totaled $25,636,744; last year they amounted to $25,636,518. Procter & Gamble'e earned surplus as of June 30, last, was $202,312,166. A year ago it was $199,882,196. U. S. Government securities held by the firm, according to the latest report, total $20,226,756, an increase from the $5,251,985 reported a year ago. Inventories have been reduced by about 40 per cent during the latest fiscal year: $85,306,302 (1949), $142,783,132 (1948).

Brand Preference Surveys

Consumer brand preferences for soaps, other cleaning agents, polishes and waxes in the Philadelphia and Seattle marketing areas are incorporated in recently released consumer analyses of those areas. Each analysis contains a complete section on soaps and cleansers. The Philadelphia survey, its fourth, is published by the Philadelphia *Bulletin*, while the second Seattle study was compiled and published by the Seattle *Times*. Both are modeled after the older, Milwaukee *Journal* Consumer Analysis.

Brand preferences for soaps and related cleaning materials are listed by uses. The following products were given the highest rating in the categories listed in the Seattle survey: "Toilet Soap—Bath," *Ivory;* "Toilet Soap—Face and Hands," *Lux;* "Soap for General Household Laundry," *Oxydol;* "Soap for Dishes," *Ivory* (both bar and flakes); "Soap for Fine Fabrics," *Ivory* (flakes and bar); "Soap for Walls, Floors, Woodwork," *Spic and Span;* "Window Cleaner," *Gold Seal Glass Wax;* "Pot and Pan Cleaners," S.O.S.; "Scouring Powder," *Old Dutch Cleanser;* "Silver Polish," *Wrights;* "Furniture Polish," *Johnson's;* "Self-Polish Wax," *Johnson's;* "Liquid, Rubbing Wax," *Johnson's;* "Paste Wax," *Johnson's.*

The Philadelphia Consumer Analysis shows these products to be the leaders in the classifications listed: "Soap or Other Products Used for Dishes," *Tide;* "Soap or Other Products Used for Fine Fabrics," *Lux Flakes;* "Soap or Other Products for Household Laundry," *Rinso;* "Cleaners for Walls, Floors, Woodwork," *Spic and Span;* "Toilet Soap for Bath," *Lux;* "Toilet Soap for Hands and Face," *Lux.*

In addition, brand preferences for tooth paste and tooth powder are given in the section on cosmetics and toilet goods in the Philadelphia survey. Silver polish and floor wax preferences are covered in the home and equipment section of the consumer analysis for Philadelphia. *Silver Suds* occupies top position as the most widely preferred silver polish, while *Johnson's* wax is the most popular brand of the liquid self-polish; liquid rubbing and paste wax groups.

AHA Buyers' Guide

Manufacturers of soaps, synthetic detergents, insecticides, disinfectants and other chemical specialties listed in the recently issued 1949-50 "Blue Book of Allied Members of the American Hotel Association" include: American Oil & Disinfectant Corp., New York; Armour & Co., Chicago; B. T. Babbitt, Inc., New York; Colgate-Palmolive-Peet Co., Jersey City, N. J.; Darworth, Inc., Simsbury, Conn.; DuBois Co., Cincinnati; Economics Laboratory, Inc., St. Paul; Gallowhur Chemical Corp., New York; Industrial Chemical Laboratories, Inc., Omaha; S. C. Johnson & Son, Inc., Racine, Wisc.; Kelite Products, Inc., Los Angeles; Lever Brothers Co., Cambridge, Mass.; McCormick & Co., Baltimore; Nuodex Products Co., Elizabeth, N. J.; Procter & Gamble Co., Cincinnati; Solventol Chemical Products, Inc., Detroit; John T. Stanley Co., New York; Swift & Co., Chicago; Turco Products, Inc., Los Angeles; Virginia-Carolina Chemical Corp., Richmond, Va.; West Disinfecting Co., Long Island City, N. Y.; Wyandotte Chemical Corp., Wyandotte, Mich.

In addition to a directory of firms, there is also a product listing. The directory goes to over 6,000 hotels in the Association's national membership.

P&G Largest Advertiser

With a total 1948 advertising expenditure of $31,620,501, Procter & Gamble Co., Cincinnati, was the largest advertising in the U. S., again last year. In third place of the top 10 largest national advertisers was Lever Brothers Co., Cambridge, Mass., with a figure of $16,296,514. Colgate-Palmolive-Peet Co., Jersey City, N. J., occupied fourth place having spent $16,004,502 for advertising last year.

Felton Announces Changes

Felton Chemical Co., Brooklyn, recently announced the appointment of James Leonard of Dallas, Tex., as their representative in Texas and western Louisiana. The new Felton address in Dallas is 1207 S. Industrial St., where stocks of the company's products are carried.

Another Felton change involves David Marso, who has been transferred from Brooklyn headquarters to Atlanta. He is covering the southern states. Leo C. Weinrobe, with headquarters in St. Louis, is now acting in a general supervisory capacity for the entire southern territory in addition to covering his regular sales area of Missouri, Kansas, Oklahoma and Arkansas.

Sandburg on NACA Board

Rudolph W. Sandburg, controller of the Andrew Jergens Co., Cincinnati, was elected a director of the National Association of Cost Accountants at the thirtieth annual international cost conference in Chicago recently. He is a past president of the Cincinnati chapter of NACA, and has been active in the association for the past 15 years. A native of Olean, N. Y., Mr. Sandburg received his A.B. degree from Cornell University in 1917. Prior to becoming controller of the Andrew Jergens Co. in 1943, he was staff accountant of Ernst & Ernst for 22 years.

PMMI Meets Oct. 31-Nov. 2

The seventeenth annual meeting of the Packaging Machinery Manufacturers Institute will be held at the Edgewater Beach Hotel, Chicago, from Oct. 31 to Nov. 2, 1949. The meeting is the first to be held by the Institute in Chicago in 10 years. A three day program of business sessions and events has been planned for the meeting.

Among those serving on the program committee under chairman John P. Corley, vice-president of the Institute and vice-president of Miller Wrapping and Sealing Machine Co., Chicago, are H. Lyle Greene, president of J. L. Ferguson Co., Joliet, Ill., and Louis R. Muskay, president, Triangle Package Machinery Co., Chicago.

found

Climbing trees and observation towers . . . looking through telescope and binoculars will not help you find the *perfect scent* for your particular product. But here's how you can find it: **Set your sights on D&O . . .** Here you will find more than 150 years of experience, extensive world resources, modern research and compounding laboratories, skilled master perfumers. Here, too, you will find myriads of new, exciting fragrances being created . . . new and unusual perfumery materials being developed to meet new conditions, to solve new problems, to anticipate tomorrow's trends. Here, then, at D&O is where you *will find* the *Profitable*, the *Correct*, the *Perfect* scent for your product . . . and the happy solution to your most complex perfuming problems. Consult D&O.

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RAW MATERIAL MARKETS

As of August 29, 1949

THE fat and oil market continued, in recent days, the upward turn that began in July. In the last few days the market softened up somewhat, but the overall position shows considerable improvement. Tallow is officially quoted at 7¾ cents for the fancy grade, but soapers report difficulty in buying it at under eight cents. Early in August tallow was being quoted at 6⅜ cents, an advance from the previous month's quotation of 5⅞ cents. That the fat and oil market is shaking off the lethargy of the past few months is evident from the fact that the price of 88 per cent tallow chip soap was recently advanced one cent a pound on bags, single list price. This reversal of the usual order of downward changes is the first such in nearly a year. The previous price had been in effect for over five months.

Coconut oil, on which the two cent processing tax for oil of non-Philippine origin went into effect two days ago, is currently quoted at 15½ cents a pound, crude basis, Pacific Coast. Copra prices have risen from $165 to $180 in the past month.

Other oils, prices of which have advanced include crude cottonseed oil, now quoted at 14½ cents, as against 13¼ a month ago and 10½ cents two months ago. Corn oil, currently at 15½ cents, is bringing two and one-half cents more per pound than it was early in August and almost five cents more than two months previously. Soybean is now selling for 13 cents, which represents a gain from the August 4 price of 11⅛ cents. Peanut oil is 3½ cents higher than it was a month ago, with the current quotation being 19 cents.

Buying for export as well as domestic purchases are said to be responsible for the pick-up in prices of almost all fats and oils. The low level to which prices had fallen was a real inducement to heavy buying on the part of manufacturers who had the storage space, trade sources point out. Whether heavy buying of fats and oils for domestic use would have the effect of boosting prices beyond the reach of foreign purchasers and thus causing demand and prices to slacken, remains to be seen.

U. S. exports of fats and oils in the period of January to May, 1949, totaled 1,157,000,000 pounds, according to a recent summary of the Bureau of Agricultural Economics of the U. S. Department of Agriculture. In summarizing the fats and oils situation, the bulletin states that, exports for the first five months of the year were about two and one-half times the total for the same period last year, and at an annual rate well above exports of any previous year. Exports in May, 1949, totaled 313 million pounds in terms of oil, which was slightly less than in April. Leading exports in the January to May period consisted of lard, inedible tallow and greases, soybean oil and cottonseed oil.

Although imports of fats and oils will be lighter than a year ago, our domestic production will be near record levels this year. Imports were relatively small in May, although copra imports increased moderately over recent months. The January-May import totals were 380 million pounds, as compared with 584 million pounds in 1948.

Another record or near-record supply of fats and oils in the United States is in prospect for 1949-50, with a substantial increase in lard production virtually certain. Planted acreages of oilseeds this year are greater than in 1948. Cotton and flaxseed acreages were increased, while soybean and peanut acreages were reduced. The 1949 pig crop is expected to total about 96 million head, about 13 per cent more than in 1948, thus assuring an increased production of lard and grease in 1949-50.

Estimates recently submitted to Congress by the Economic Cooperation Administration indicate that the quantity of U. S. fats, oils, oilseeds and fat-and-oil products to be imported in 1949-50 by the countries participating in the European Recovery Program would be about 800,000,000 pounds. This is a monthly rate of about 67 million pounds compared with 78 million pounds in April, 1948, to May, 1949, the first 14 months of ERP.

A story that 1300 tons of crude glycerine were being shipped here from Russia was published recently. The purchases of the material, which was to arrive in two shipments during August-October, were reported to have been made through London. Two 500-ton shipments and another of 300 tons were to be made.

The demand for insecticides continued good throughout August. DDT is getting a big play, although sales of the material are down as a result of the Department of Agriculture's warning against its use around dairy barns and on cows and because of "scare" stories published last spring. As a result of the moderately heavy incidence of polio, fly control has been emphasized, which is a factor in larger DDT sales.

Price advances were recently reported on No. 1 carnauba wax. The new price is $1.12, an advance of two cents over the previous price. No. 3 North Country is up one cent. Candelilla is a half cent higher and the refined is up one cent.

On the essential oil front, advances were reported on citronella from Java, patchouli and ginger oil. Palmarosa and peppermint declined. Aromatic chemicals remained at about their previous levels.

Antara Products
General Aniline & Film Corporation

Antara Extra

An Antara Products Publication

Detergents
Emulsifiers
Wetting Agents
Dispersants
Carbonyl Iron Powder

444 MADISON AVENUE NEW YORK 22, N. Y. SEPTEMBER, 1949

INSTITUTIONAL CLEANERS AMONG BEST SELLERS FORMULATED WITH ANTAROX DETERGENTS

Antarox "A-180" is excellent for compounding hard surface cleaners—for rubber, marble, tile, porcelain, terrazzo, etc. On applications such as illustrated above, it is far superior to soap powder because of its efficiency and because it cuts down labor costs. A typical solution contains one tablespoonful of Antarox "A-180" in a bucket of water.

Four non-ionic detergents with excellent wetting, emulsifying, dispersing and foaming properties are the starting point for the compounding of some of the best-selling institutional cleaners on the market.

The four non-ionics, known as Antarox A-400, A-480, A-200, and A-180, are aromatic polyglycol ethers. They are all excellent hard surface cleaners. Among the commercial products compounded with them are floor cleaners, wall cleaners, all-purpose office cleaners, terrazzo cleaners, painted surface cleaners, dishwashing compounds, window cleaners and automobile cleaners.

Sold by Antara Products, General Aniline & Film Comporation, 444 Madison Ave., New York 22, the Antarox "A" series are liquids which are unaffected by hard water. They have many advantages in the compounding of institutional cleaners. Good for most any types of floors, they give outstanding results in cleaning. They will not etch the surface of marble or terrazzo, even after long usage.

Information on the Antarox "A" series for institutional cleaning is yours for the asking. Write today to Antara Products.

Antara Product— Koresin — Useful to Many Industries

Koresin, a unique synthetic resin which is a t-butyl phenol-acetylene condensate, has found many interesting applications in industry since its introduction in 1945 as a tackifier for GR-S rubber.

As an outstanding synthetic tackifier for GR-S, Koresin played an important part in the production of rubber during the war years. Its unique properties attracted the interest of paint and varnish manufacturers, ink makers, chewing gum manufacturers and others.

Koresin has a melting range of 120-160°C. It is soluble in hydrocarbons, drying oils, ketone, esters and sec-butanol. It is compatible with GR-S, oil-soluble phenolics, coumaroneindene resins, polyvinyl butyral, polyvinyl chloride, methyl methacrylate, ethyl cellulose. It is available in commercial quantities in 350-lb. Fiberpaks from the Grasselli plant.

For information and prices, write, outlining your specific problem, to Antara Products, General Aniline and Film Corporation, 444 Madison Ave., New York 22.

Carbonyl Iron Powders Offered as Chemicals

Carbonyl Iron Powders, long produced at the Grasselli, N. J. plant of General Aniline & Film Corporation solely for use in high frequency cores for electronics, now are available for chemical use.

Until early this year, the company explains, the entire production of carbonyl iron powders was taken up by the electronics industry. GA&F's newly-leased plant at Huntsville, Alabama makes it possible to offer the material to other industries.

Carbonyl iron powders are made from liquid iron pentacarbonyl and are unique in that the particles formed are spheres and free of non-ferrous metals. Companies interested in this remarkably pure form of iron are invited to write for information.

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(Advertisement)

BIDS AND AWARDS

P. O. Scouring Powder Bids

Among the bids on 1,139 barrels of scouring powder in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., were those of Cambridge Chemical Co., Cambridge, Mass., item 1, 6 cents; Murro Chemical Co., New York, items 1 and 2, 3.9 cents, item 3, 6 cents; Marjo Products Co., Chicago, item 1, 3.88 cents, 2, 4.20 cents and 3, 5.49 cents; Fischer Industries, Inc., Cincinnati, item 1, 5.95 cents, 2, 6.15 cents and 3, 8.95 cents; Imperial Products Co., Philadelphia, item 1, 5.4 cents, 2, 6.5 cents and 3, 8 cents; Pal Products Manufacturing Corp., Brooklyn, item 1, 3.35 cents; 2, 4.65 cents and 3, 7 cents; Chemical Manufacturing & Distributing Co., Easton, Pa., item 1, 3.58 cents, 2, 4.17 cents; Unity Sanitary Supply Co., New York, item 1, 6 cents, 2, 7 cents and 3, 8 cents.

Cream Hand Cleaner Bids

Bids on an unspecified quantity of cream hand cleaner in a recent opening for miscellaneous supplies by the Bureau of Federal Supply, U. S. Treasury Department, Washington, D. C., were received from: Viking Manufacturing Co., Natick, Mass., on item 51-C-1313-190 for Chicago and Washington, D. C., 24 and 22 cents, on item 51-C-1313-200 for Washington, D. C., West Point, Ga., Fort Worth and Denver, 37, 39, 41 and 41 cents; Ditto, Inc., Chicago, on the first item 20 and 22 cents, on second item, all 35 cents; B. & G. Chemical Corp., Baltimore, on first item, 15 and 14 cents, on second item, 19, 31.5, 23.5 and 35 cents; MacIntosh & Sheridan, Washington, D. C., on first item, 35 cents on both, on second item, all 55 cents; Milburn Co., Detroit, on first item, both 14 cents, on second item, all 19 cents; Autocopy, Inc., Chicago, on first item, both 17 cents, on second item, 20 cents on all; Potomac Products Corp., Washington, D. C., on first item, 20 and 18 cents, on second item, 25, 27, 28 and 28 cents; Marquette Paper Corp., Chicago, on first item 13.5 and 14.5 cents, on second item, 22.75 cents for all items; H. Packwood Mfg. Co., St. Louis, on first item, 13.9 and 14.7 cents, on second item, 23.7, 23.2, 23.8 and 24.6 cents; Cadet Laboratories, Worcester, Mass., on first item, both 12 cents, on second item, all 14.5 cents; Beck Duplicator Co., New York, on first item, both 18 cents, on second item, 28.5, 29, 29 and 29 cents; Chemical Specialties, Springfield, Mass., on first item, 15.25 and 14.5 cents, on second item, 22.5. 23.25, 25.5 and 25 cents; Pilgrim Products, Worcester, Mass., on first item, both 10 cents, on second item, all 13.75 cents; L. C. Smith & Corona Typewriters, Syracuse, on first item, 26.6 cents for both, on second item, 47.8 cents for all; Goetz Petro-Chemical Co., Buffalo, N. Y., on first item, 23 and 22 cents, on second item, 36, 42, 42 and 42 cents; Krayer Mfg. Co., Elizabeth, N. J., on first item 15 and 12.5 cents, on second item, 16.9, 18.4, 19.8 and 20.2 cents; Tudor Chemical Specialties, New York, on second item only, 16.88, 17.88, 18.88 and 19.01 cents; and M. Averell & Co., New York, on first item, $2.25 a gallon on both, on second item, $2.25 a gallon for all.

Phila. ASO Polish Bids

The following bids were received on an unspecified quantity of polishing compound in a recent opening for miscellaneous supplies by the Philadelphia Aviation Supply Office, Philadelphia: Park Chemical Co., Detroit, item 1a, 11.8 cents, b, 13.4 cents, total $25,612.65, transportation charges and tax included, del. to Philadelphia $.009 per unit, Oakland, 2.5 cents, result f.o.b. Detroit each item 10.9 cents; Bri-Test, Inc., New York, item 1a 12.7 cents, b, 12.1 cents, total $27,-344.12; Franklin Research Co., Philadelphia, item 1a, 10.9 cents, b, 12.1 cents, total, $23,281.10; R. M. Hollingshead Corp., Camden, N. J., item 1a, 9.61 cents, alternate, 9.11 cents, b, 10.97 cents, alternate, 10.47 cents, total, $20,916.06, alternate, $19,898.-58.

Treas. Floor Wax Bids

In a recent opening for miscellaneous supplies by the Federal Bureau of Supplies, U. S. Treasury Department, Washington, D. C., the following bids were received on an unspecified quantity of floor wax: Harley Soap Co., Philadelphia, 88 cents; M. C. Thomas Co., Norwalk, Conn., $1.02; Crystal Soap & Chemical Co., Philadelphia, $1.80; Windsor Wax Co., Hoboken, N. J., 59 cents; Uncle Sam Chemical Co., New York, 59 cents; Service Parts Co., Baltimore, 78 cents; Franklin Supply Co., Providence, R. I., $1.88; Fuller Brush Co., Hartford, Conn., $1.15; Twin City Shellac Co., Brooklyn 83 cents; R. M. Hollingshead Corp., Camden, N. J., 59 cents; J. A. Tumbler Laboratories, Baltimore, 54.9 cents; Buckingham Wax Co., Long Island City, N. Y., 59.8 cents; Trio Chemical Works, Brooklyn, 51.2 cents; New Jersey Chemical Co., Lyndhurst, N. J., 98 cents; John C. Stalfort & Sons, Baltimore, $1.35 cents; Gold Seal Co., Bismarck, N. D., $1.768; Continental Car-Na-Var Corp., Brazil, Ind., $2.592; Davies-Young Soap Co., Dayton, O., $1.30; Bri-Test, Inc., New York, 54.8 cents; E. B. Snyder Laboratories, Philadelphia, $1.21; Hamilton Paper Corp., Richmond, Va., $1.16; Industrial Chemical Co., Lenoir, N. C., $1.05; Lincoln-Schleuter Floor Machinery Co., Chicago, $1; Char-Ev Products Co., Pataskala, O., $1.46; Sanitary Floors Corp., Washington, D. C., $1.25; Joseph E. Frankle Co., Philadelphia, 55.5 cents; Oil Specialties & Refining Co., Brooklyn, 61.5 cents; Wilbert Products Co., New York, 75.1 cents; Ultra Chemical Works, Paterson, N. J., 70.25 cents; Wallach Grocer Export Corp., New York, $1.10; Huntington Laboratories, Huntington, Ind., $1.23; Turco Products Corp., Chicago, 89 cents; Central Engr. & Supply Co., Passaic, N. J., $1.08; Cambridge Chemical Co., Cambridge, Mass., 65 cents;

NEW TRADE MARKS

THE following trade-marks were published in the August issues of the *Official Gazette* of the United States Patent office in compliance with Section 6 of the Act of February 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

Deflamer—This for solution to be added to textiles to impart resistance to mildew, etc. Filed Feb. 18, 1946 by Eronel Industries, Los Angeles. Claims use since Feb. 13, 1946.

Kayo—This for tooth paste. Filed May 25, 1946 by Kayo Drug Co., New York. Claims use since July, 1925.

Mark 5—This for insecticides. Filed June 14, 1946 by Dorsett-Jones, Inc., Baltimore. Claims use since Feb. 27, 1946.

Peel—This for compound for removing wallpaper. Filed July 6, 1946 by Paul-Lewis Laboratories, Inc., Milwaukee. Claims use since June 7, 1946.

The following trade-marks are published in compliance with section 13 (a) of the Trade-Mark Act of 1946. Notice of opposition must be filed within 30 days of publication and a fee of $25 must accompany each notice of opposition.

Big Bath—This for toilet soap. Filed Mar. 17, 1948 by Colgate-Palmolive-Peet Co., Jersey City, N. J. Claims use since Dec. 1911.

Auto-Chlor—This for cleanser for hand dishwashing. Filed Feb. 24, 1948 by Auto Chlor System, Inc., Memphis. Claims use since June 1, 1941.

Lustersuds—This for soap for washing silks, etc. Filed Sept. 21, 1948 by H. Kohnstamm & Co., New York. Claims use since July 1, 1940.

Ammen—This for antiseptic powder. Filed Feb. 27, 1947 by Charles Ammen Co., Alexandria, La. Claims use since Apr. 15, 1905.

Closetmaster—This for perforated holder and volatile mothproofing chemical cake. Filed Dec. 19, 1947 by Irwin-Willert Co., St. Louis. Claims use since Oct. 15, 1947.

Cooper-Tox—This for livestock insecticidal spray. Filed Mar. 20, 1948 by William Cooper & Nephews, Inc., Chicago. Claims use since Feb. 14, 1948.

Hart's Auto Gloss—This for automobile cleaner and polish. Filed Sept. 27, 1947 by Hart Manufacturing & Sales Co., Portland, Ore. Claims use since May 22, 1947.

Hart's—This for automobile cleaner and polish. Filed Sept. 27, 1947 by Hart Manufacturing & Sales Co., Portland, Ore. Claims use since 1916.

Eastern States—This for furniture polish. Filed Mar. 5, 1948 by Eastern States Farmers' Exchange, West Springfield, Mass. Claims use since Jan., 1927.

Eastern States Cooperative—This for furniture polish. Filed Mar. 5, 1948 by Eastern States Farmers' Exchange. West Springfield, Mass. Claims use since Nov. 20, 1936.

Old English—This for paste wax. Filed Nov. 3, 1947 by Boyle-Midway, Inc., Jersey City, N. J. Claims use since 1896.

Casco—This for mechanical sprayer containing aerosol insecticide. Filed Mar. 10, 1948 by Casco Products Corp., Bridgeport, Conn. Claims use since Feb. 6, 1948.

Pennclean—This for cleaner for dairy utensils. Filed Nov. 7, 1947 by Pennsylvania Salt Manufacturing Co., Philadelphia. Claims use since Apr. 25, 1947.

Winkie—This for liquid synthetic detergent for use as a household cleaning preparation. Filed Nov 12, 1947 by Michigan Chemical Corp., St. Louis, Mich. Claims use since Oct. 2, 1947.

Lens Luster—This for lens cleaner. Filed Nov. 24, 1947 by Barnett and Ramel Optical Co., Kansas City, Mo. Claims use since Jan., 1937.

Old-Tanner—This for liquid shoe dressing. Filed Dec. 9, 1947 by John H. Pfingsten, Milwaukee. Claims use since Aug. 1, 1947.

Do . All—This for detergent compound for general household cleaning purposes. Filed Mar. 5, 1948 by Armour & Co., Chicago. Claims use since Sept., 1925.

Eastern States — This for cleansing compound for dairy use. Filed Mar. 5, 1948 by Eastern States Farmers' Exchange, West Springfield, Mass. Claims use since May, 1935.

Super Life—This for metal polish. Filed Mar. 10, 1948 by Cussins and Fearn Co., Columbus, O. Claims use since Apr. 1, 1940.

Shaft—This for liquid product for use in shaving. Filed Aug. 13, 1948 by Carter Products, Inc., New York. Claims use since July 22, 1948.

Hy-Wite—This for soap used for laundry purposes. Filed Sept. 21, 1948 by H. Kohnstamm & Co., New York. Claims use since May, 1939.

Beacon—This for metal polish. Filed Oct. 1, 1948 by Cincinnati Oil Works Co., Cincinnati. Claims use since Sept., 1913.

Colony House—This for general household cleaner. Filed Oct. 12, 1948 by H. W. Hamilton Co., New York. Claims use since Aug. 19, 1948.

Colitho—This for cleansing cream for removing printing inks, etc., from the skin. Filed Oct. 14, 1948 by Columbia Ribbon & Carbon Manufacturing Co., Glen Cove, N. Y. Claims use since Mar. 15, 1948.

Spook—This for hand cleaner. Filed Oct. 16, 1948 by Spook Products Co., Detroit. Claims use since Apr. 19, 1941.

Ponce de Leon—This for shampoos. Filed Aug. 5, 1947 by Mabel E. Moore, Roslyn Heights, N. Y. Claims use since Jan. 15, 1946.

Nel—This for antiseptic powder for athlete's foot. Filed Feb. 27, 1948 by Beck Products, Detroit. Claims use since June 16, 1947.

Curley—This for shampoos. Filed July 8, 1948 by Curley Co., Philadelphia. Claims use since 1930.

Aerofume—This for insecticides. Filed July 26, 1948 by Eston Chemicals, Inc., Los Angeles. Claims use since June 9, 1948.

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Fixatives for Rose Perfume

Excellent rose fixatives include gayol butyrate, C_9, C_{10}, and C_{11} aldehydes, phenyl ethyl salicylate, neryl proprionate, and dimethyl octanyl phenyl acetate. S. Gottfried and L. Basendale, *Perfumery & Essen. Oil Record 40*, 118-23, 157 (1949).

Scouring Wool

For the scouring of raw wool, detergents of the sodium alkyl aryl sulfonate type have been widely accepted for reasons of both quality and economy. This type of detergent is particularly successful in scouring pulled wool where large quantities of lime are carried into the system and produce conditions that make scouring with soap difficult.

Woolen yarns or fabrics that have been lubricated with mineral oil may be scoured with the sulfonate by itself or in combination with sodium chloride or sodium bicarbonate. Yarns or fabrics which contain animal—or vegetable-oil lubricants are handled to good advantage by addition of soda ash to the detergent. O. M. Morgan, *Textile World 99*, No. 4, 129, 268-74 (1949).

Textile Detergents

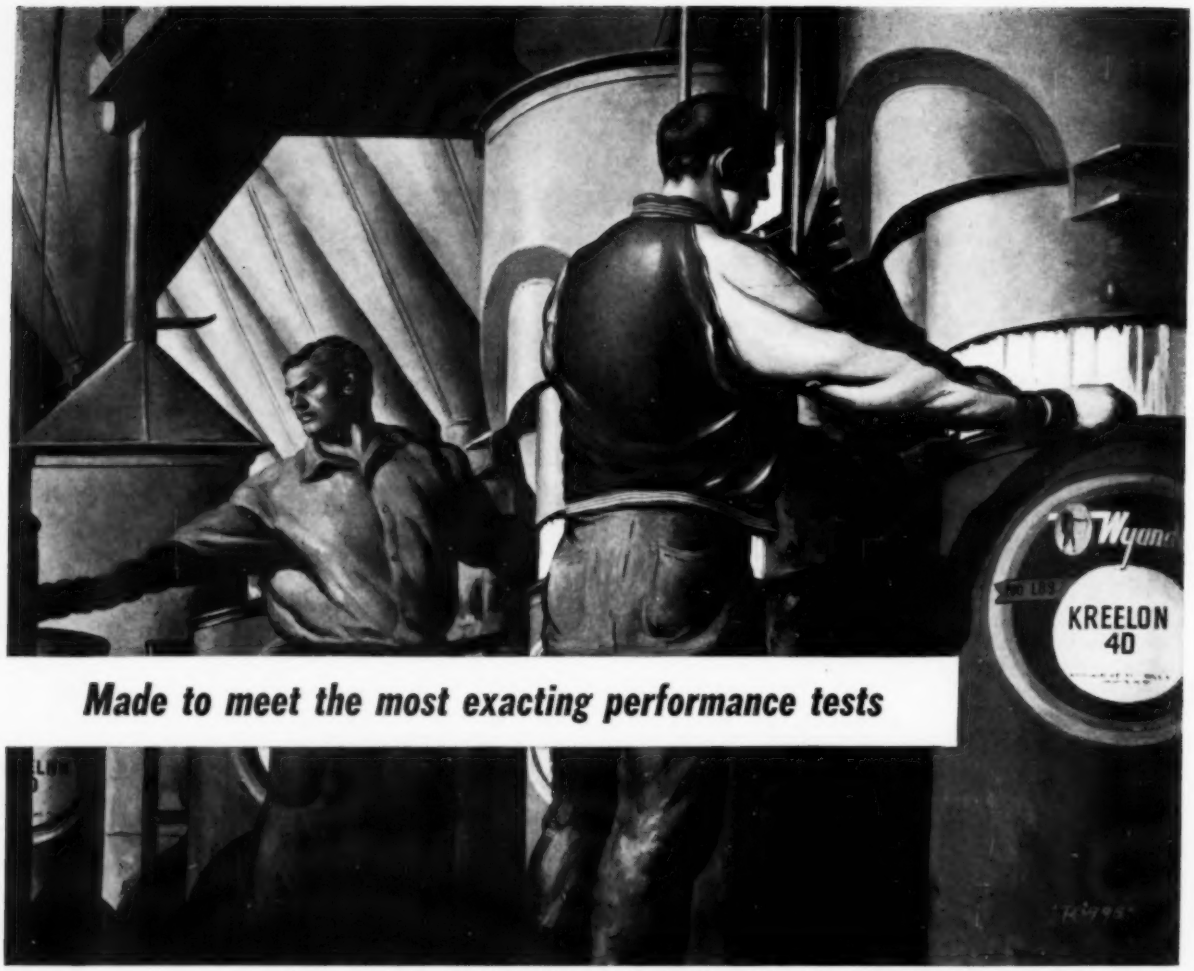
The great success of synthetic detergents in the dyeing of direct colors on fabrics does not mean that synthetics can or will replace soap entirely in the textile industry. The recent highly publicized campaign surrounding addition of carboxy methyl cellulose to synthetics in order to outperform soap is the definite admission that soap alone is superior to synthetics in the laundry field. From recent work it appears that carboxy methyl cellulose improves the detergency mainly of the alkyl aryl sulfonates and alkyl sulfates, which were always known to be among the poorest of the detergents in the laundry field. The sulfonate of oleyl methyl tauride is a better detergent for this application and can also be used in hard water, acid, salt, or dyeing liquors. H C. Borghetty, *J. Am. Oil Chemists Soc. 26*, 319-21 (1949).

Fatty Esters as Emulsifiers

Fatty-acid esters of glycol, propylene glycol, and glycerol, with the exception of glyceryl monooleate, did not cause emulsion formation of water in petrolatum. Glycol monostearate and propylene glycol monostearate afforded slight emulsification at concentrations greater than 10 per cent. The fatty-acid esters of sorbitan and mannitan are excellent emulsifying agents. A. Halpern and N. Squeglia, *J. Am. Pharm. Assoc.*, Sci. Ed. *38*, 290-2 (1949).

Resin Acid Emulsifiers

The sodium salts of the methyl, ethyl, and propyl esters of the addition product of maleic anhydride and *l*-pimaric acid have been prepared and used as soaps in the emulsion polymerization of butadiene and styrene. The physical properties of the vulcanizates of polymers prepared with these soaps were greatly improved by addition of fatty acid on the mixing rolls. Best results were obtained with the ethyl ester. F. L. McKennon,



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WYANDOTTE KREELON—*the white, uniform detergent and wetting agent*

If you produce cleaning compounds or other products that call for an effective synthetic organic detergent, you'll find the answer in *Wyandotte Kreelon**. Or if some operation in your plant requires an unusual amount of time and labor in the wetting-out process, chances are that Kreelon can help you do a *better job, faster.*

This versatile chemical, broadly classified as a surface-active agent, is designed to meet rigid performance specifications. Initial production of Kreelon was delayed for months until the product's color, chemical analysis and performance measured up to the highest standards. Controlled production maintains these standards.

The three grades of Kreelon produced range from *white* to *light cream* in color and have only a faint characteristic odor. Equally important is the fact that they retain their wetting, sudsing and cleansing properties in acid, alkaline or neutral solutions — in hard or soft waters.

Wyandotte Kreelon is readily available and economically priced. Complete information on its properties and suggested uses will be furnished at your request. In addition, our experienced technical staff stands ready to assist you in solving many detergency problems.

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OTHER ORGANIC AND INORGANIC CHEMICALS

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A. J. Johanson, E. T. Field, and R. V. Lawrence, *Ind. Eng. Chem. 41*, 1296-8 (1949).

Sodium Metaphosphate

There are only 3 different modifications of the metaphosphates prepared by dehydration of monosodium phosphate, NaH_2PO_4,H_2O by heat: the dimer, the trimer, and the polymetaphosphate or Graham's salt. The first exists below 260°C., the second at 260-625°, and the last above 625° C. The composition of the poly form varies with temperature of preparation and it is not a hexamer. These conclusions are based on a number of physicochemical studies. Sodium hexametaphosphate transforms to the polymerized Graham's salt at a temperature 30° lower than does sodium trimetaphosphate. The aqueous hexameta acid splits, as do the trimeta and polymeta acids, into ortho- and pyro-phosphoric acid at room temperature, but the half-life is 5 times as great. A structure is suggested for the hexameta ion. I. W. Teicher et al, *Acta Chem. Scand. 2*, 225-51; through *Chem. Abs.*

Soap as a Lubricant

Studies with use of an Almen Extreme-Pressure testing machine indicate that the soap in lubricating greases is a primary lubricant rather than merely a thickener for the mineral oil, while the latter is simply a carrier for a dispersion of soap. The mechanism presented is that the polar end of the soap molecule is bonded more firmly to the metal surface than the nonpolar end. The importance of a true dispersion of soap in mineral oil is emphasized. The physical state of soap and its dispersion in mineral oil, rather than the chemical composition of the soap, determine to a large extent the final nature of the lubricating grease. It is recommended that the processing of the soap be used as a basis for grease specifications. C. J. Boner, *Petroleum Processing 3*, 1193-4, 1196.

Oil Palm Sources

The American hemisphere is dependent on the Orient, the South Pacific, and West Africa for the bulk of its supplies of lauric acid-type oils such as coconut and palm kernel, and of palm oil, requirements for which are estimated at more than 375,000 tons annually. The coconut palm, *Cocos nucifera*, and African oil palm, *Elacis guineensis*, are entirely adaptable to plantation cultivation in the American hemisphere. In addition, the American oil palm, *Corozo oleifera*, an indigenous palm, is probably also adaptable to plantation cultivation.

Wild oil-bearing palms, while numbered in the tens of millions, and perhaps hundreds of millions, cannot be depended on at present as an economic source of lauric acid oils. In order to insure an uninterrupted supply of these valuable oils in or near the consuming countries, and especially in close proximity to the United States, every conceivable effort should be made to develop large-scale plantation cultivation of coconut and African oil palm, and experimental plantations of the American oil palm in the American hemisphere. K. S. Markley and D. W. Jenkins, *J. Amer. Oil Chemists' Soc. 26*, 257-67 (1949).

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Designed by specialists with a background of 75 years of experience and service to the industry.

THE HOUCHIN LINE INCLUDES:

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GIANT 14-INCH HOUCHIN PLODDER
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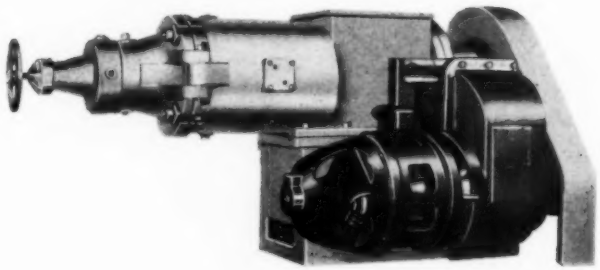

This giant Houchin Plodder has a capacity of from 4,000 to 6,000 pounds per hour. Screw diameter is 14 inches. Houchin Plodders have screw diameters from 2½ to 14 inches.

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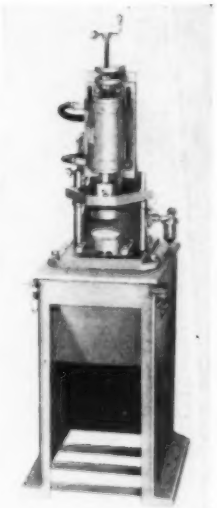
Designed for heavy duty milling of toilet and flake soap.

MODEL "A" SAFETY AIR PRESS

A feature of this press is that the operator must use **both** hands to operate the press. Two air control levers must be held down **simultaneously.**

Other features are:

Single or multiple power strokes, any desired "dwell." Pressures up to 2500 lbs. Automatic lubrication. Other models with pressures up to 10,000 lbs.



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PRODUCTION SECTION

Formulating Cream Shampoos

Shampoos based on synthetic detergents are more satisfactory in paste or cream form than as liquids because of greater latitude in formulation to cut degreasing.

IT is recognized that the outstanding defect of the majority of soapless liquid shampoos is their marked degreasing action on the hair and scalp. Since it is difficult to reduce the excessive solvent action of synthetic detergents without affecting the clarity and good appearance of the solution, the most practical way of tackling the problem of producing a really satisfactory shampoo of this sort is to make it in the form of a cream or paste. The following formula, based on synthetics, contains superfatting agents:

	Per cent
Sulfated cetyl-stearyl alcohol (Lanette wax SX)	15
Sulfated lauryl alcohol	55
Cholesterol	0.3
Lecithin	0.3
Animal or vegetable oil	3
Preservative	0.2
Water, to make	100

Cholesterol, lecithin, and oil are emollient or "hair conditioners," and have some effect in depressing the lather formation. They are desirably included, however, to overcome excessive degreasing.

Soap and synthetic may be combined in a cream shampoo, as in the following:

	Parts
Coconut oil	10
Castor oil	4
Coconut fatty acids	10
Stearic acid	10
Triethanolamine	2
Caustic potash	5.5
Caustic soda	0.75
Borax	0.5
Sulfated fatty aclohol (liquid)	3
Diethylene glycol	2
Glyceryl monostearate, technical	2
Stearyl alcohol	2
Methanol	4
Water, softened	44

Saponification of the oils is effected with the mixed alkalis and 20 parts of the water. The fatty acids and the balance of the water are then added, followed by the remaining constituents until the soap formed has facilitated complete emulsification. The saponification values of the coconut oil and fatty acids are assumed to be 260, and those of stearic acid and castor oil around 200, with the strength of caustic potash 89 per cent, and of caustic soda 98 per cent. The reaction should be neutral to phenolphthalein and only faintly pink to litmus. In order to offset the discoloration caused by triethanolamine soap on aging, a trace of tartrazol yellow or naphthol green may be included. Both dyes stand up well under these conditions.

This second formula gives abundant lather and leaves the hair and scalp in excellent condition. It is also mild on the hairdresser's hands if employed in the beauty parlor. Ingredients for making cream shampoos may be classified under the following general headings:

Basic detergent. Soap or synthetic.

Auxiliary detergents. Sodium sulfate and chloride with synthetics, sodium metaphosphate, tetrasodium pyrophosphate.

Conditioning agents. Lanolin and its derivatives, lecithin, linseed fatty-acid cut, cetyl, stearyl, and oleyl alcohols, glyceryl and glycol stearates, diglycol laurate, "Carbowaxes."

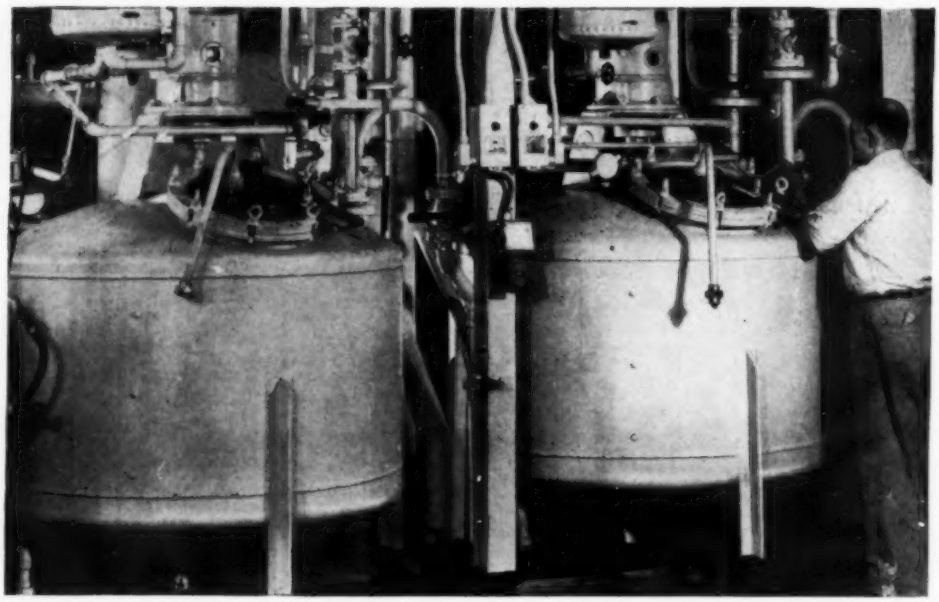
Other constituents. Glyceryl monostearate in soap-synthetic mixtures to improve the consistency, alginates, colloidal silicate gels, carboxymethyl cellulose, tragacanth. Note: Alginates and methyl cellulose should not be used together. Opacifying and thickening agents include stearic acid and stearates, spermaceti, and white pigments such as titanium dioxide. These also tend to reduce lathering properties. Pigments do not always prove satisfactory in use, so that stearates are more likely to be desirable.

A humectant such as glycerine, diethylene glycol or sorbitol, is desirable but should not exceed 4-5 per cent. These additions also assist in keeping the finished product stable and of uniform consistency over a reasonably wide range of temperature. Perfume, dyestuff, and preservative are also normal constituents.

The finished product should be stable on storage, non-irritating, pleasantly perfumed, attractive in appearance, reasonably inexpensive, as simple as is technically possible, of the correct consistency, and above all, completely satisfactory as a hair and scalp cleaner. The final specification is the most difficult to meet. Charles Morel, *Soap, Perfumery, Cosmetics* 22, 478-82 (1949).

For nearly 14 years, the *ingredients* of

. . . have been protected by Nickel-Clad Steel



In operation since 1935, the two bottom tanks of this caustic mixing equipment at Bristol-Myers Company, Hillside, N. J., are Lukens Nickel-Clad Steel; fabricated by Theodore Walter Copper Works of Newark, New Jersey.

There's no metallic contamination of these shaving soap ingredients because they're processed in nickel—no catalytic action to cause off-color by-products. That's why nickel was specified from top to bottom of this mixing equipment. It protects the products and assures long equipment life. After nearly 14 years of use, the tanks are still on the job continually.

Since the bottom tanks work under pressures up to 20 psi, thicker sections were required. By employing Lukens Nickel-Clad Steel, the fabricator obtained adequate thickness—a 20% cladding of nickel permanently bonded to a steel backing plate giving the protection of *solid* nickel at the lower cost of *clad* steel plate.

Do your processes call for nickel, stainless steel, Inconel or Monel? You can get their protection with Lukens Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels; plates as wide as 178 inches or to over 3 inches thick. Claddings 10% or 20% of total plate thickness suit most needs. The extra-smooth sodium hydride finish makes equipment extra easy to keep clean.

Bulletins 449 and 492 give you additional data. For copies, write Lukens Steel Company, 446 Lukens Building, Coatesville, Pennsylvania.

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SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

Variables in Detergency

DETERGENCY is known to be very complex, but the many studies in this field have brought about a better understanding of what the principal variables are. These variable factors can be listed as follows:

1. Nature of the surface to be cleaned, including its chemical and physical properties, and configuration or shape.
2. Nature of the soil components.
3. Composition of the bath itself and concentration of total bath ingredients in relation to weight of material being cleaned.
4. Washing conditions, including temperature, duration, and type and degree of mechanical agitation.
5. Relative quantities of material to be cleaned, soil, and bath liquid.

These variables are all controllable, but to control them in a way to produce optimum conditions requires much study of the systems involved. One factor not yet sufficiently recognized as to importance, is the influence of the material or substrate itself. Susceptibility to cleaning among various fibers, by different agents, is illustrated by the results in the following table obtained under standardized conditions:

Type of Fabric	*Per cent Soil Removal by Alkyl aromatic sulfonate*	*Soap*
Cotton	18.0	20.9
Wool	36.8	0.0
Viscose rayon	14.5	19.7
Viscose rayon, with urea-formaldehyde finish	4.7	9.5
Acetate rayon	42.0	31.0
Nylon knit goods	41.0	45.3
Fiberglass goods	40.5	53.8
Silk, lightweight dress fabric	60.8	79.4
Silk, military powder bag material	0.0	0.0

Soap and synthetic detergent, which was 90 per cent active, were both used at a bath concentration of 0.2 per cent.

The results show somewhat superior effectiveness of soap over the synthetic in washing cotton, but vastly superior effectiveness of the same synthetic in washing wool. Viscose rayon treated with urea-formaldehyde to give permanent crush resistance is extremely hard to clean; acetate rayon is very easily cleaned, as is also nylon, the latter with either a synthetic or soap. Fiberglass is easily washed, but more easily by soap than by the synthetic. The results with silk show the great difference obtained with (1) loosely woven fabric and (2) very tightly woven fabric, both made from the same fiber. The tightly woven fabric holds the soil mechanically and so prevents its removal.

Mechanical action in cleaning has sometimes been underemphasized, as shown by the following results, obtained on cotton fabric with the use of a "Launderometer." The detergent used was an active alkyl aryl sulfonate at a concentration of 0.2 per cent. The ratio of fabric to bath was varied by use of two sizes of swatches, small ones 3" by 6½", large ones 8" by 8", and two volumes of bath liquid, 100 ml. and 200 ml. Mechanical action was varied by use of different numbers and different sizes of balls in the pint-glass jars.

Agitating Elements for Mechanical Effect	*% Soil Removal*			
	Small Swatches		*Large Swatches*	
	100 ml.	*200 ml.*	*100 ml.*	*200 ml.*
None	20.0	20.4	15.9	20.4
8 ⅝" plastic cubes	22.3	21.8	16.3	17.5
14 ¼" steel balls	28.5	23.9	18.3	20.6
6 1.2" glass balls	33.9	27.4	19.5	18.4

The smaller swatches were cleaned more effectively than the larger. The most effective cleaning was with the small swatches in 100 ml. bath liquid, the most favorable ratio of fabric to liquid of those used. As an over-all result, the 6" glass balls gave superior mechanical cleaning. The differences in results between no balls in the jars and 6" glass balls show that suitable mechanical action during the cleaning process can account for an increase in per cent soil removal of 50 per cent or more.

The detergent process consists of several steps. First both substrate and soil must be wet by the bath. Ions of the bath ingredients, of high specific charge, are adsorbed on soil and possibly on substrate. These can modify the electrostatic attractive forces between soil and substrate, and are also effective in suspending the removed soil and preventing its redeposition. Colloidal particles are also adsorbed on the soil, and possibly also on the substrate. This is important in deflocculating the soil particles. Some solubilization of soil occurs in the bath liquid.

Although these considerations may seem general in nature, they can be surprisingly helpful in solving practical scouring and cleaning problems. A. M. Schwartz, *J. Am. Oil Chemists' Soc. 26*, 212-15 (1949).

Setting Peroxide Values

Peroxide values in oils can be determined iodometrically as follows: Dissolve a three to 10 gram sample in 20 ml. of carbon tetrachloride or chloroform and, while bubbling in carbon dioxide, add 30 ml. of glacial acetic acid containing 0.4 per cent of hydrochloric acid and one ml. of saturated potassium iodide solution. After five minutes add 100 ml. of water and titrate liberated iodine with 0.01 Normal thiosulfate. P. Mucciolo, P. Assis Ribeiro, and V. Bonoldi, *Rev. faculdade med. vet.* Univ. Sao Paulo 3, 272-82; through *Chem. Abs.*

Surface Tension Method

The shapes of pendant drops are calculated and from the results the constants necessary for the evaluation of surface tension are derived. The method should give results as reliable as those of the capillary-tube method. S. Fordham, Proc. Roy. Soc. (London) *A194*, 1-16; through *Chem. Abs.*

Reducing Fat Splitting Costs

IN CONTINUOUS methods of fat splitting, the high temperatures required can be localized and do not necessarily involve the correspondingly high pressures throughout the system which render present plants so expensive both to install and to maintain. Essential features to obtain efficient and economical fat splitting at relatively low overall pressures are as follows:

(1) The central operation of hydrolysis should be carried out in vessels separate from those primarily concerned with the separation of the products of the reaction.

(2) Immediately following hydrolysis, the reaction products should be subjected to:

High relative motion to a large excess of hot water to promote solution of the glycerine. Turbulence should be kept at a minimum to limit the formation of stable emulsions at this stage.

Physical action, for example, centrifugal, to promote the separation of sweetwater from fatty acids and unreacted oil and its removal therefrom in the opposite direction in a gravitational sense.

(3) Intimacy of contact between oil and water throughout the reaction zone should be promoted, by means other than the effect of high temperature in increasing the solubilty of water in fat. Emulsification, through homogenizing valves, centrifugal and/or gyratory motion, steam-induced velocity changes, are effective.

(4) Consistent with the above, in a secondary separating column, maximum countercurrent flow of water to ascending reaction products should be maintained, remote from turbulence.

(5) To permit maximum water present in the system and high relative motion of fat and water, the evaporation of water from sweetwater and its condensation and return to the system should be integrated with the splitting operation.

(6) The complete process should incorporate measures for maximum heat conservation to permit a high circulation rate of water and low average concentration of glycerine in water, while being consistent with economical glycerine recovery.

(7) A catalyst should be used to permit relatively low working temperatures and pressures, but it should be confined to the primary reaction zones and its uniform distribution should be promoted. Gyratory action has proved most effective.

(8) Fatty acids from the process should be dehydrated and cooled immediately, in order to minimize discoloration. As much of their heat content as possible should be conserved, for example by transmission to countercurrent water make-up.

There are many other essentials, but the foregoing are those most vital. Superimposition of these special provisions on sound practice in the design of chemical equipment would certainly result in efficient continuous fat-splitting equipment within the financial reach of the medium and small manufacturer. *Soap, Perfumery, Cosmetics 22*, 384, 385, 391 (1949).

Fatty Alcohol Emulsifiers

The straight-chain alcohols from C_{20} to C_{30} were synthesized and their ability to cause water absorption by petrolatum was studied. The C_{20} alcohol caused the greatest water absorption, and the C_{24} alcohol had the lowest optimum concentration. Alcohols with the carbon-chain length greater than 24 had the same optimum concentration, 3 per cent. The study indicates that molecular size and the orientation of the alkyl group play an important part in the emulsifying properties of the fatty alcohols. A. Halpern and Wm. J. Wilkins, *J. Am. Pharm. Assoc.*, Sci. Ed. *38*, 283-6 (1949).

Soap Micelles

Calculated values for the radii of spherical micelles of potassium laurate and sodium tetradecyl sulfate are consistent with the measured distances between micelles. There are good reasons for believing the micelles to be of closely constant size in any one solution and to vary but little with concentration. G. S. Hartley, *Nature 163*, 767-8 (1949).

Detergent Estimation

Of the numerous methods for estimating the ionized detergents and wetting agents, many depend on formation of an insoluble precipitate on mixing the cationic with the anionic type. Pinacyanol bromide serves as an excellent indicator for the end point of this titration. The titration can be carried out by running anionic agent into the cationic agent or vice versa. The former seems preferable because of color change from purplish blue to pinkish purple. A suitable amount of indicator is 0.1 ml. of a 0.05 per cent solution per 10 ml. of sample solution being titrated. M. R. J. Salton and A. E. Alexander, *Research 2*, 247-8 (1949).

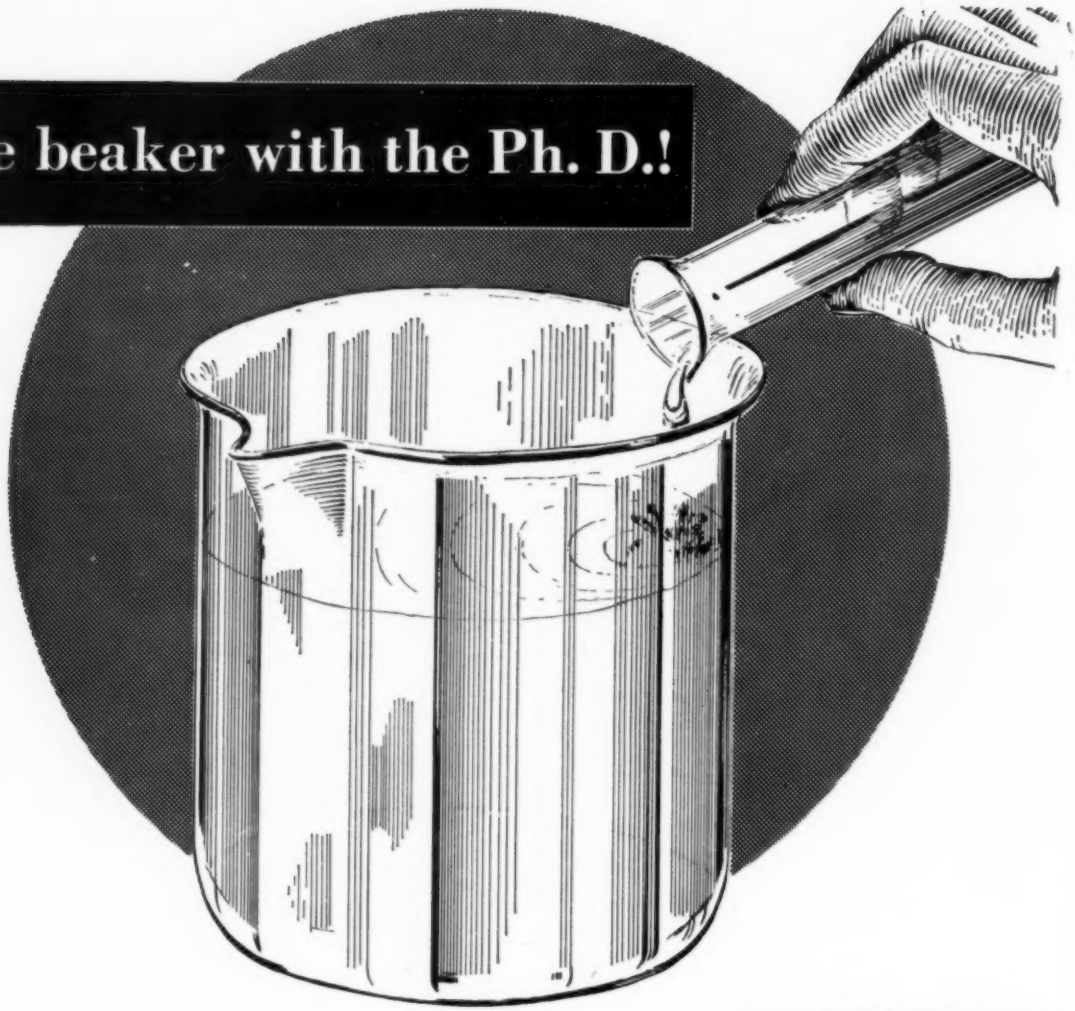
Maleic As Antioxidant

Maleic and fumaric acids were good antioxidants for rape and olive oils in the dark and in sunlight. Maleic acid was more effective than fumaric acid. The antioxidant effects were strongest at room temperature and were weakest but significantly apparent with storage at —15°C. W. Heimann, Z. *Lebensm.-Untersuch. u. -Forsch. 88*, 586-93.

Soap, Fatty-acid Analysis

A study has been made to ascertain whether conductometric and potentiometric titration methods can be applied to the analysis of fatty and rosin acids, soaps, and acid-soap mixtures. Utilizing a solution of isopropyl alcohol-water as solvent, it has been found that although potentiometric titrations are of limited applicability, conductometric methods lend themselves very readily to such determinations. Direct titration with base can be used to determine fatty and rosin acids, and titration with acid can be used for analysis of soaps. By an indirect titration method, the soap and acid contents, or the soap and alkali contents, of soaps and soap solutions can be determined by a single titration. *Anal. Chem. 21*, 691-5 (1949).

The beaker with the Ph. D.!



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Typical Analysis
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Cloud Point °F	46° — 49°
Color Lovibond 1" Red	5 — 8
Color Lovibond 1" Yellow	20 — 40
Unsaponifiable %	2.0%—2.5%
Saponification value	196—199
Acid Value	195—198
% F.F.A. as Oleic Acid	98%—99.5%
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PRODUCTION CLINIC

By E. G. THOMSSEN, Ph.D.

IN MANY one or two story factory buildings no elevators are available to carry materials used for manufacturing and other operations. Most such buildings, when they were erected, required no mechanical means for raising and lowering heavy materials or machinery. When used for new or different purposes, the lack of an elevator presented a problem. In a number of cases, while an elevator could be used there is not enough tonnage to warrant the expense of installing a lifting device. As a result, in many small plants, particularly, loads are elevated by back breaking methods, or with crude, cumbersome, home-made devices that are both dangerous and extravagant.

It is not necessary to use such inefficient means of raising or lowering tonnages from floor to floor. The problem may be solved with lifting or conveying appliances, or by building an elevating device of one's own design. The cost is most often paid for in a short time because rapidity of handling loads economizes on labor costs which too often are overlooked. Such lifting devices may fall into two categories: inclined plane lifts and vertical lifts.

The simplest inclined plane lift consists of a long, gradual sloping ramp. If the slope is too steep, the ramp may be built in two or more sections with a landing intervening. Ordinary flat trucks, if they are not piled too high or overloaded, may be used on such a ramp. A winch, or block and fall may be used for the power by hooking the chain or cable to the truck. If powered trucks or jitneys are available, they can be driven up the ramp under their own power.

Where it is necessary to keep loads level at all times a slightly different variation of the sloping ramp idea may be employed. Two iron rails, with the necessary support, are set up at an angle to give the incline a gradual slope. A wooden platform, to which are attached two small and two larger wheels, flanged like those on railroad trucks, is set on the tracks or rails. The platform remains level at all times. Power for this lift is advantageously supplied by a power winch.

DR. THOMSSEN

When loads are not too heavy, special conveyors built on a slant find ready use. These are made in standardized units by some suppliers. They are available in widths up to 18 inches and in any specified length up to 30 feet. Loading and take offs may be at floor level or higher if desired. Low first cost, ease of installation and economy of operation recommend this method of lifting. By working two or more men a constant stream of packages can be rapidly handled on this device.

We recently mentioned on this page a stair climbing cart that has been used to carry loads up to 500 lbs. The cart is used like an ordinary two wheel hand truck until the stairs are met. Then two belts are disengaged and adapted to the slant of the stairs. These belts crawl the load up. Brakes actuated from the truck handle prevent any slipping backward.

A vertical lift is more desirable than bringing a load up a slope. It takes less space and is easier to control. There are different ways of lifting loads straight upward without using the ordinary elevator. Some of these are just elevators by another name. The most satisfactory method we have seen is a platform supported on a rather inexpensive, slow moving, hydraulic ramp. These are built to raise loads up to 30 feet, using oil-electric, oil-air or water as power. Most common, however, are electric hoists. Very often a home-made car that runs up and down on channel irons or I beams is actuated by a powered hoist. This makes a very satisfactory elevator for lifts through one or two floors, provided safety precautions are taken and the set-up is in accordance with local factory and insurance regulations. Such devices are actually improvised elevators so that they may come under regulations controlling the use of elevators. In other cases, chain hoists with a trolley are suspended to an overhead I beam. Once the load is elevated it may be easily transported in a straight or gradually curved line either by man power or electric power on the order of an electric crane.

These chain hoists or load lifters come in a number of capacities from 250 lbs. upward. Small horse power is required considering the weights lifted. They are easily installed and may be actuated very readily by remote controls. Various types of suspension may be used and low head room is no barrier for specially built hoists. There is little danger involved in operating them, nor do they present any great problem from the breakdown angle. The use of electric hoists is on the increase. They are quite inexpensive.

Another method of lifting loads vertically is by the use of self-contained elevators, also termed stackers or lifts. Special names like "Revolvators" or "Lowerators" are assigned to special equipment built by certain companies. Lift and fork truck manufacturing companies build special machines for specific needs. Capacities up to 30,000 lbs. may be had. In the case of fork lift trucks, they both convey and hoist a load and are adaptable for certain kinds of work, especially for lifting loads into freight cars or trucks

where no shipping platform is available.

There is no reason why so many plants should continue to use outmoded methods of hoisting materials with so many more economical methods of overcoming the difficulty at hand. It is false economy to stint on purchasing equipment and waste workmen's energy and tempers in lifting heavy loads.

Better Cation Exchange Resin

"AMBERLITE IR-120," made by Rohm & Haas Co. of Philadelphia, is a new, cation exchange resin that offers improvements for industrial water softening. It possesses unusual properties of stability and has a high capacity. Flow rates equal to 25 gallons per square foot per minute in a 30-inch deep bed have been used with less than five per cent reduction in capacity. No deterioration results in water of low silica content. This is important for water softening. Immersion at near boiling temperatures for long periods does not affect the resin adversely. It is stable over the entire pH range.

Improved Sanitizing Agent

AT A recent meeting of the Society of American Bacteriologists, I. J. Hutchings and Helen Xezones presented a paper on evaluation of a number of germicides and proprietary cleaners. They have found that peracetic acid is more effective than high chlorine content disinfectants, as well as certain quaternaries. They claim peracetic acid shows considerable promise as a disinfectant for sanitizing procedures in food plants because of its high efficiency and its harmless residue.

Book On Wetting Agents

A NEW book entitled "Surface Active Agents: Their Chemistry and Technology" by Schwartz and Perry has come to our attention. It is published by Interscience, New York. This work renders a valuable service to this increasingly important field. It covers in detail the processes for manufacturing surface active agents, discusses both in theory and practice their physical chemistry and outlines fully their practical applications in the textile, detergent, cosmetic, pharmaceutical, germicidal, fungicidal and many other fields. It is a book that anyone interested in wetting agents should possess.

Detergent Statistics

THE 1949 Britannica Book reports that we were a cleaner nation in 1948 than in 1949. Possibly the lower cost of soaps and detergents is the cause. According to this work, the United States consumed 2½ billion pounds of soap during the year 1948 or six per cent more soap than in 1947. In addition to this, 400 million pounds of synthetic detergents were used. We have also seen the figure of 600 million pounds, for detergents. Predictions made over several years that synthetics would represent about 20 per cent of the detergents market are borne out by these statistics.

Improved Rotary Pump

BLACKMER ROTARY PUMP CO., of Petoskey, Mich., have long featured the bucket or swinging vane construction of their rotary pump. Another type pump based upon a sliding vane is now offered by them. By the use of this pump, a greater range of liquids can be handled, including very viscous types and volatile fluids like gasoline. These vanes are operated by push rods that go through the rotor and shaft of the pump. They may be replaced without disturbing any piping.

Expendable Pallets

ADDISON-SEMMES CO., of Racine, Wisc., is licensing certain makers of corrugated paper board to produce an expandable pallet under their patents. These pallets cost less than a dollar, hold loads of several thousand pounds and may be made to weigh as little as three lbs. When goods are loaded into cars or trucks on pallets when shipped, these features are especially attractive.

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Booklet on Sodium

A 50-page booklet on the subject of sodium, and bearing that title, was issued recently by National Distillers Chemical Corp., New York. Covered in the new booklet, in addition to a brief history of the materials, are sections on handling and storage of sodium, its properties and applications, chemical reactions of sodium and a table of isomerizations by sodium and sodium bases. There is also a comprehensive bibliography. Copies are available by writing the company at 120 Broadway, New York 5, N. Y.

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Nonyl Phenol Bulletin

Publication of a 15-page technical bulletin describing the properties, chemical reactions and uses of nonyl phenol, an alkylated phenol that can be used in the production of surface-active agents and insecticides, and now being produced in commercial quantities at the Oil City, Pa., plant of Koppers Co., Inc., Pittsburgh, was announced recently by the company's chemical division. The reaction products of nonyl phenol with ethylene oxides are surface-active agents, which show promise as synthetic detergents. The compound is a slightly viscous yellow liquid which is miscible with all common organic solvents. It is only slightly soluble in water and in dilute solutions of alkalis. Copies of technical bulletin C-9-125, which also contains a list of 75 references to the technical literature, will be sent upon request by Koppers Co., Chemical Division, Koppers Building, Pittsburgh 19, Pa.

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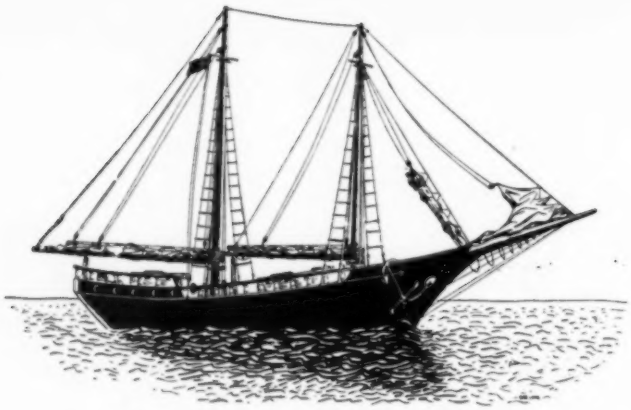
General Chemical Catalog

General Chemical Division of Allied Chemical & Dye Corp., New York, recently announced publication of a 176-page illustrated catalog of its line of heavy and fine chemicals. The latter are made under the Baker & Adamson trade mark. In addition to a complete product listing, which includes information on formulas, physical properties, grades or strengths, packing, shipping regulations and principal uses, there is a comprehensive reference section. In this section tables, factors, reference data and information on handling and storage are given. Newcomers to the company's line, including the "Airex" aerosol moth proofer are covered in the new catalog in a special section on other products and services of General Chemical, which was founded just 50 years ago.



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Closure Folder

Drum and steel pail closures are discussed in a recently issued four-page folder of Rieke Metal Products Corp., New York. For steel drums, the firm's closure, "ViseGrip" is illustrated and described. A similar section deals with "FlexSpout" closures for steel pails.

Revise "Laboratory Letters"

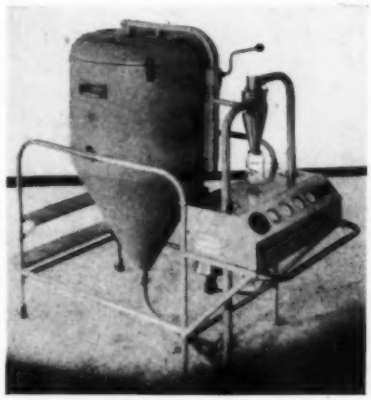
A fourth revised edition of "Laboratory Letters," written by Alexander Schwarcman, chief of the research laboratory of Spencer Kellogg and Sons, Inc., Buffalo, New York, was issued recently by the firm. The present volume of approximately 150 pages of text represents a doubling in size of the original edition, which was published in 1920. The new work covers advances made in vegetable oil technology, including new developments in oil chemistry, new plant processes and the adaptations of new oil seeds to commercial use. Plant and laboratory scenes, as well as illustrations of many of the vegetable oil sources are shown in the book.

Soaps in Cosmetic Study

Soaps, shampoos and bubble bath are rated by groups and by brands in a recent survey of its readers by *Woman's Home Companion* magazine. The survey, "Cosmetics in Use," is divided into five categories, in four of which soaps, shampoos or bubble bath are used. In three of these divisions: "Care of Face," "Hand Care" and "Sweet and Neat" bath products, soap ranks first. In "Care of Hair," liquid shampoo was found to be most widely used, followed by cream shampoo, and soap. In each of the divisions or categories, which are broken down farther into types of product, brand preferences are listed. Copies of the study are available by writing the research department of *Women's Home Companion*, 250 Park Ave., New York.

Portable Spray Drier

A portable version of its spray-drying unit was announced recently by Niro Corp., New York. The new unit, which is fitted with wheels for mobility, makes possible pilot plant studies on the practicability of spray-drying. It is constructed of stainless steel and glass, and features a compact control panel and eye-level window in the drying chamber, which has a top that is easily removable for cleaning. The new unit is equipped with both electrical and gas heating elements, either of which may be used. Its capacity is 2 to 15 pounds of water evaporated per hour, depending on the material and temperature applied to the drying air.



New Niro Drier

Book on Perfume Chemistry

THE CHEMISTRY OF PERFUMERY MATERIALS, by R. W. Moncrieff. Published by United Trade Press, Ltd., 24 Bride Lane, Fleet Street, London, E. C. 4, England. 344 pages, 5 1/5 x 8¾ inches. 30 shillings.

Publication of "The Chemistry of Perfume Materials," by R. W. Moncrieff, author also of "The Chemical Senses," was announced recently by United Trade Press, Ltd., London, England. The book is divided into three parts, dealing with: "Perfumery Synthetics," "Olfactory Research," and "Essays on Olfaction." As the author points out in the foreword: "The purpose . . . in writing Part I of this book has been to assemble in logical order and accessible form the salient features of the chemistry of perfumery materials, and to present the perfumer with a reasoned description of the synthetics that are available and of which he may make use." Part I has chapters on hydrocarbons; alcohols and phenols; aldehydes; acetals; ketones; ketals; esters; ethers; ether-esters; lactones; nitrogenous compounds; acids, acyloins, halides and sulfur compounds. There is also a chapter on properties of perfumery materials.

Part II deals mainly with physiological factors of olfaction, which are also covered in Part III. The concluding feature is an author index and a subject index.

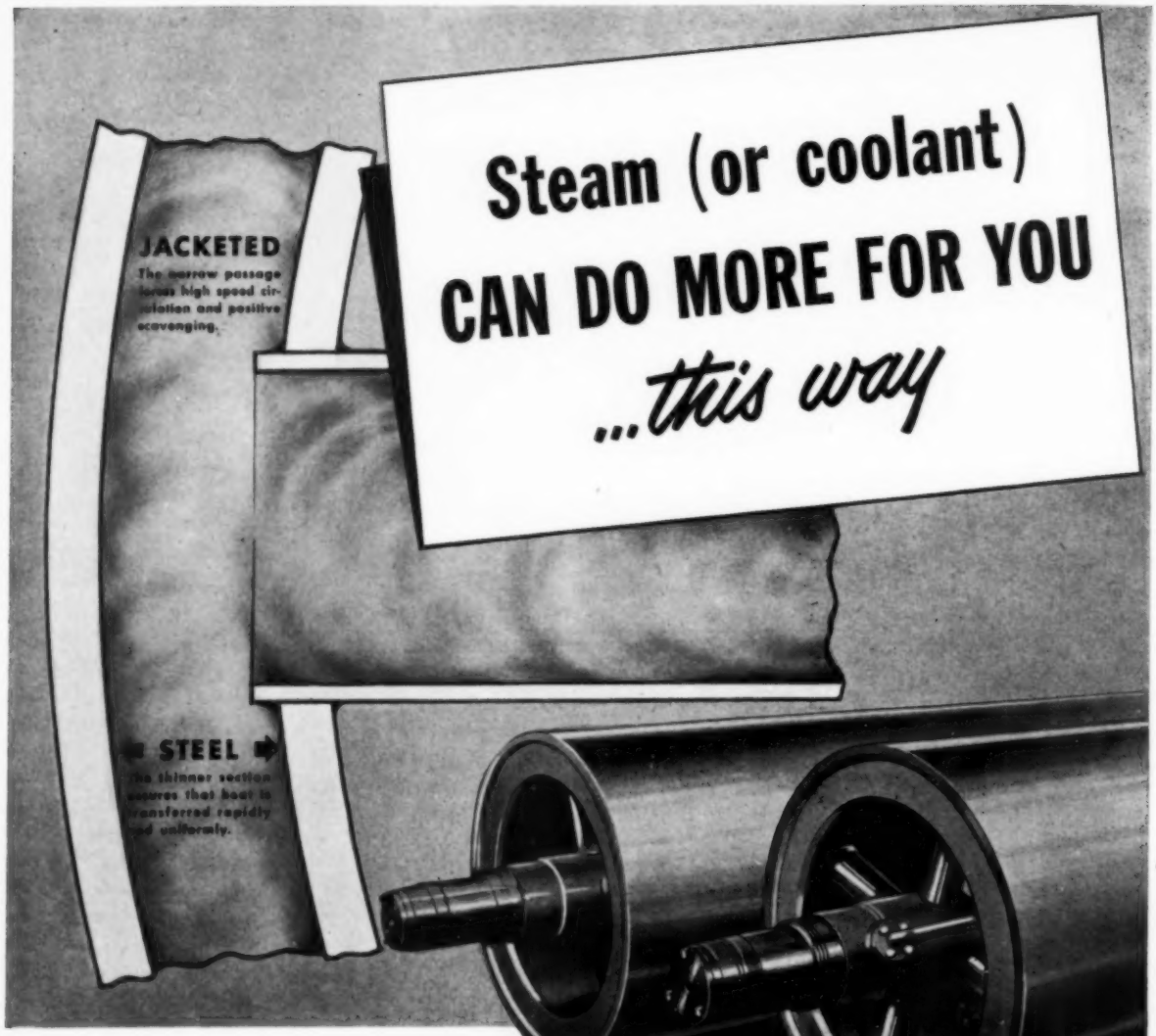
New Handbook of Chemistry

HANDBOOK OF CHEMISTRY AND PHYSICS, 31st Edition, edited by Charles D. Hodgman, M. S., published by The Chemical Rubber Co., Cleveland, 2756 pages, 4½ x 7 inches, cloth binding, price $6.00.

The Handbook of Chemistry and Physics, which has just appeared in its 31st edition, is widely accepted as a reference book in its field. Compiled in five sections, it includes complete mathematical tables; properties and physical constants of the elements; properties of organic and inorganic compounds; chemical tables; tables of specific gravity; properties of matter; heat and hygrometry; sound; electricity and magnetism; light; conversion tables; photographic formulae; table of plate and film speeds; and a large amount of other important data. Much new material appears in the 31st Edition. A table of logarithms of decimal fractions has been added; also a table of squares of the Sine and Cosine and their product. The former table of arrangement of electrons in orbits has been replaced by a table of electronic configuration of the elements. In step with the trend toward more intensive study of nuclear physics, a table of isotopic masses has been included; also a table of wave lengths of the principal lines in the emission spectra of the elements. This table is taken from data only recently available. Complete revisions and new material added to the Handbook amount to 180 pages.

Bulletin on Solvents

A bulletin on the use of volatile solvents—their use and handling—was issued recently by Safety Research Institute, Inc., New York. A case history of improper solvent use and suggestions on handling are discussed.



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PRODUCTS AND PROCESSES

New Sulfonate

A surface-active compound is made by reacting an organic compound containing at least one non-aromatic ethylene linkage, with nitrogen trioxide or nitrogen tetroxide to form a reactive organic nitrozation product. This is reacted with aqueous alkali sulfite at 60-130°C. to give sulfonated compounds. L. J. Beckham, to Allied Chem. & Dye Corp. Canadian Patent No. 455,828.

Palm Oil Soap

A German special soap is made from two-thirds palm oil and one-third palm-kernel oil. The soap at first was a reddish yellow, but later was whitened out by storing for a month under a glass roof in the light, which had the desired bleaching effect. This soap has proved very popular with the housewife because of its natural violet odor. It is made only from the best grades of palm oil, including Lagos, Benin, and Sherbro. After the soap boiling is finished, the heat is turned off and the kettle contents are allowed to stand for a time. Later a sort of crutcher is introduced, with wooden paddles extending from the center to the rim of the kettle This is moved up and down. In a separate kettle brine solution is heated. This is added in small portions to the soap kettle until the desired salting out occurs. The kettle at this time can be filled nearly to the brim. Salting out occurs readily and no difficulties are encountered in the whole process. E. Ley, *Seifen, Ole, Fette, Wachse 75*, 155-8 (1949).

Potassium Determination

Determination of potassium as potassium iodate has been applied to the analysis of soap and caustic lye. The precipitated periodate is completely reduced, and the liberated iodine is titrated with standard thiosulfate. Large numbers of samples may be analyzed simultaneously in a relatively short time. The method is applicable to industrial control work. W. J. Miller and J. T. R. Andrews, *J. Am. Oil Chemists' Soc. 26*, 309-12 (1949).

Pressure Saponification

One difficulty with saponification under pressure and with stirring is that the soap becomes spongy and foams strongly. This can be overcome by carrying out the saponification under pressure in a vessel freed of air, in which the empty part of the vessel is filled with a vapor which condenses to a liquid on cooling. The following formula has been used:

Coconut oil	112	kilograms
Caustic soda, 125°	20.5	kilograms
Water	90	liters
Alcohol	90	liters

The mixture is introduced into the saponification vessel and brought to a boil. When the mixture of water- and alcohol vapor has forced out all air, the vessel is closed and stirring is begun. The rest of the process is as usual. H. Manneck, *Seifen, Ole, Fette, Wachse 75*, 112 (1949).

Antiseptic Soap

Sulfanilamide, sulfapyridine, or sulfathiazole are added to soaps to form an antiseptic commercial product. The antiseptic agent may be in the form of sodium or other salts, or in solution in ethyl alcohol, glycols, or glycerol. Soc. italiana Commercio estero, Italian Patent No. 421,241.

Mineral Fillers in Soap

Soaps containing semistable suspensions prepared with soda ash and zinc chloride will not have silt-like deposits as with previous mineral fillers. E. Waldesbuhl, Swiss Patent No. 228,652; through *Chem. Abs.*

Diethanolamine Soap

An excess of diethanolamine is reacted with a glyceride ester of a fatty acid having eight to 18 carbon atoms in the chain, at 140-170°C. for two to four hours. The mixture is cooled to below 100°C. A quantity of higher fatty acid is added sufficient to produce three to 15 per cent of soap in the reaction products. The mixture is aged at 50-80°C. for 10-48 hours. H. H. Young and D. Rubinstein, to Swift & Co. Canadian Patent No. 456,218.

Detergents from Paraffin

In a study of detergents produced from fatty acids obtained by oxidizing paraffin wax, it was found that sodium alkyl sulfonates offered no advantage over sodium alkyl sulfates. The C_{16}-C_{18} products gave the best results with cotton, C_{14}-C_{16} with wool, while the C_{14} chain gave the best foaming power. The presence of a double bond lowered these optimum chain lengths by two carbon atoms. Introducing a more active group into the molecule lessened the detergent power, the more so the further it was from the carboxyl group. Detergents from mixed normal acids gave the best effect. The presence of oxygen-containing groups lessened the efficiency of the detergents. FDX 121 (PB 74,994); through *J. Soc. Dyers & Colourists 65*, 73 (1949).

Surface-active Salt

A surface-active salt is water-soluble and comprises a diacetone alkamine salt of a fatty acid containing 12-20 carbon atoms. V. E. Haury and S. A. Ballard, to Shell Development Co. Canadian Patent No. 456,603.

Dentifrice Base

As a free-flowing dentifrice base, dry granules of finely divided particles of a dentifrice polishing agent are mixed with a wetting agent comprising the sodium salt of the lauryl ester of sulfosalicylic acid. H. V. Moss and T. W. Schilb, to Monsanto Chem. Co. Canadian Patent No. 457,102.

Emulsifying Agent

Dioctyl N- (beta-sodium sulfo ethyl) aspartate is produced by the reaction of beta-sodium sulfo ethyl amine and dioctyl maleate. K. L. Lynch and H. J. West, to Am. Cyanamid Co., Canadian Patent No. 456,127.

SOAP PLANT OBSERVER

By John W. McCutcheon

A detergent is a cleaning agent and its definition among scientific people has never been very hard to understand, even if the public does get mixed up. In one recent survey conducted by a large newspaper an attempt was made to find out if the public knows a synthetic detergent from soap. The question was asked; "Do you buy any detergent products"? 15.9 per cent said they were non-users, which means that there were a lot of dirty people in that midwest town. Let us hope that *Pravda* does not get hold of this!

Some time ago a paper was written on the subject of detergency which deserves a great deal of attention because of the fundamental character of its investigation. ("Detergent Action", by O. C. Bacon and J. E. Smith, *Ind. & Eng. Chem.* 40:2361-2370). This paper points out in a concrete way that the factors of time and mechanical action are intimately related to detergency, and then sets down just what this relationship is. It is shown, for example, that a detergent loosens the dirt from the fabric and lowers the mechanical action and time necessary to clean. Cleaning efficiency increases up to a point, as the concentration of the detergent increases, after which no amount of detergent can help further. Mechanical action alone can remove soil from the point of maximum detergent concentration. In fact, from other sources, it has recently been shown that supersonic sound waves can literally bounce the dirt off a fabric. Just what it does to the cloth in the meantime has not been disclosed. At any rate, the paper mentioned above does focus attention on a very important factor in the cleaning process: mechanical action. The small horizontal home laundry for example, discussed in this space last month, lacks the mechanical action obtained by its big brother in the commercial laundry where the weight of goods being tumbled and the distance of fall are both greater. The "Terg-o-tometer" described here in May, although simulating more closely the oscillating type of washer, is also weak in respect to its control of mechanical action on the fabric. This control must be above a certain minimum level if mechanical action is to be eliminated from detergent tests.

* * *

PERHAPS there is no phase of soap making more important than the technical control necessary to insure quality and uniformity of the finished product. This control extends to checking the quality of the raw materials entering the factory and results in obtaining maximum efficiency in processing methods. Analyzing of samples is only one part of this operation. Just as important is the knowledge of where and when to take samples, what analyses to run, and how to interpret the results. To lay down any rigid procedure for these operations would be very unsatisfactory. The best that can be done is to outline generally accepted practices and principles and adapt them to suit individual needs.

Generally speaking, all raw materials entering a plant should be tested in some way. Sometimes a visual test is all that is necessary, but in each case the responsibility for checking should be clearly defined in the organization. Material coming from a new source should be given a more thorough examination than that which has come through regular channels of proven satisfaction. Some companies permit purchases of certain items only from firms on an approved list, which is prepared after extensive examination of the products. This practice is not recommended, but is used here as an illustration of the importance placed on raw material quality control. To make a purchase, it is necessary also to specify just what is wanted. Very often lack of understanding of what is wanted causes confusion leading to all kinds of trouble, including lawsuits. For example, in the purchase of caustic soda, one soap manufacturer desired a copper free product. Another manufacturer did not mind the presence of a few parts per million of copper. The result was that the caustic supplier, who handled both accounts, obligingly shipped caustic to one soaper from a plant concentrating in iron evaporators, and to the other from a plant in which monel evaporators were used.

Two points may be learned from this example. First, it indicates the necessity for clear cut specifications if high quality material is desired, and, secondly, it indicates the willingness on the part of the supplier to conform as far as possible to the wishes of his customer. Often, of course, the purchaser does not know exactly what he wants. In that case he may ask for a sample, examine it for suitability and then order on the basis of duplication. This is a most common way of purchase. It has the fault, however, of requiring a new sample from each new supplier. Perhaps a better way is to ask the supplier for his specification and adopt it in whole or part as a standard for further purchases.

A number of years ago, when sodium tetra pyrophosphate first came

on the market, a large company who never bought material except on their own specification was put in the position of asking the supplier for a specification. The problem was solved by asking the two major suppliers of the chemical to set up a specification that both makers could meet. The suppliers did, and the result is given below:

Tetra Sodium Pyrophosphate

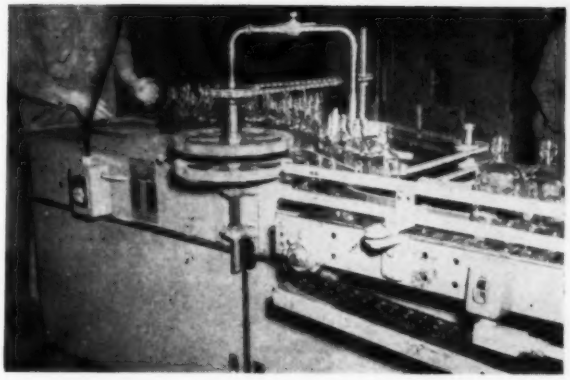
% P_2O_5	52.50% (Min.)
% $Na_4P_2O_7$	98.15% (Min.)
% Sod. Sulfate	0.50% (Max.)
% Sod. Chloride	0.15% (Max.)
% Sod. Carbonate	0.20% (Max.)
% Orthophosphate	0.50% (Max.)
% Loss on ignition	0.50% (Max.)
AS_2O_3	1.4 PPM (Max.)
Lead	2.5 PPM (Max.)
Color	white
Fineness	90% through 100 mesh screen none retained on 20 mesh.

It is always well to have at least two suppliers or more for each type of raw material used. This practice, combined with a rigid set of specifications, has often proved the necessary incentive for a producer to improve his product. In one case to the author's knowledge, it led to an improved type of carbon black for glycerine bleaching which is now standard in the trade. In another case, a soaper regularly received a salt of a quality far superior to that of his nearest competitor, and at a somewhat lower price.

If purchasing is done on specification, it is necessary to check receipts for conformity. As an illustration, assume the purchase was made on tetra sodium pyrophosphate to the specification given above. The shipment would be sampled in the orthodox way and completely checked item for item for conformity. Subsequent shipments would then be accepted from the same supplier with only basic analysis such as per cent P_2O_5, loss on ignition and color. Just occasionally would a spot sample be given a complete analysis.

Barrett Book on Solvents

A 50-page booklet on its line of aromatic industrial solvents was issued recently by the Barrett Division of Allied Chemical & Dye Corp., New York. The 8½ x 11 inch bulletin describes uses, specifications, properties and testing methods for benzol, toluol, xylol, hi-flash, c.l.s. oil and w.e.s. oil. The use of these solvents in cleaners, insecticides and a number of other products is covered. Many typical formulations are given for the uses described. The booklet also contains a section on instructions for the safe use of solvents, and the appendix gives detailed methods for 12 of the most commonly used standard tests. Although the booklet deals primarily with aromatic distillates as solvents, pure hydrocarbons are also referred to. Some of the better known derivatives of benzol and toluol are depicted in large gate-fold charts. Copies may be obtained by writing Barrett at 40 Rector St., New York 6, on company letterheads.



New unscrambling table, at right, features three conveyor belts moving at three different speeds, thus keeping the containers moving in the direction of the discharge opening. Machine was designed by Island Equipment Corp., Long Island City, N. Y.

New Jones Cartoner

A new type cartoning machine that has been successfully operated on test runs was announced recently by R. A. Jones & Co., Cincinnati, for introduction in the fall. The new machine is expected to be suitable where varied types and volume of cartoning are done.

A survey of cost-handling figures on hand and machine loading of cartons in many different types of businesses was completed recently by the company and is available.

Advertising of R. A. Jones & Co. is now being handled by Kammann-Mahan, Inc., Cincinnati.

Folder on Wet Mops

American Standard Manufacturing Co., Chicago, recently issued a folder on what to look for in a wet mop head. The cotton for a durable, effective wet-mop must be long, live fibre, according to the folder. The fibres must be uniformly spun, and there must be enough plies to insure good absorption and durability. Why mops wear out is also treated in the folder, which is available on request. The company has two other folders available: one on their wax applicators and another on their dust mops.

New Unscrambling Device

Island Equipment Corp., Long Island City, N. Y., recently announced a straight line type of unscrambling table capable of sorting containers of almost every shape and type. A special discharge arrangement keeps such odd shape containers as flasks and jars moving to the discharge conveyor. The rate of discharge depends on the size of the container and ranges from 60 large jars to 240 small bottles per minute. The unscrambling table is illustrated above.

Booklet on Glycols

Esters of glycerols and many glycols and polyglycols are treated in a new brochure recently issued by Glyco Products Co., Brooklyn. The 24-page booklet features tables of physical properties and uses of certain higher fatty acid esters. These are used in emulsifying agents, surface active agents, stabilizers and defoaming agents.

The polyglycols mentioned range from liquids of low freezing points to wax-like solids.

Bulletin on Chlorine

A new bulletin on chlorine was issued recently by Solvay Sales Division of Allied Chemical & Dye Corp., New York. It is the second edition of the Technical and Engineering Service Bulletin No. 7, Liquid Chlorine.

NEW PATENTS

Conducted by

Lancaster, Allwine & Rommel

PATENTS, TRADEMARKS AND COPYRIGHTS

402 Bowen Building, Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

No. 2,477,383, Sulfonated Detergent and Its Method of Preparation, patented July 26, 1949 by Allen H. Lewis, Berkeley, Calif., assignor to California Research Corp., San Francisco, a corporation of Delaware. The patent describes a detergent composition comprising an alkali metal salt of a mixture of sulfonated aryl-substituted alkanes consisting essentially of sulfonated monophenyl-substituted alkanes having an alkane structure corresponding to a mixture of acyclic polypropylenes, said polypropylenes having a branded chain structure resistant to fragmentation under alkylating conditions in the presence of anhydrous hydrofluoric acid catalyst, said mixture of polypropylenes having an "R factor" greater than one and boiling within the range of from about 300° F. to about 600° F., said monophenyl-substituted alkanes boiling within the range of from 475° F. to 650° F. prior to sulfonation.

No. 2,474,916, Production of Caustic Soda, patented July 5, 1949 by Hartmut W. Richter, Rahway, N. J., assignor to Metal & Thermit Corp., New York, a corporation of New Jersey. Process of producing caustic soda from sodium carbonate is covered which comprises reacting together stoichiometrical amounts of sodium carbonate and tin oxide at a temperature of about 800 to 1200° C. to form sodium stannate in dry granular form, dissolving said stannate in water, heating the dissolved stannate at a temperature in the range of about 150° C. to the critical temperature of water and at a pressure sufficient to maintain a liquid phase throughout said temperature range whereby tin oxide and free caustic soda are formed, some of said dissolved stannate remaining unchanged, separating the tin oxide and recycling it to the first mentioned reaction step to react with an additional quantity of sodium carbonate, adding sodium nitrate to the remaining solution of unchanged stannate and caustic soda to form a detinning solvent, detinning tin scrap with said solvent to form additional quantities of sodium stannate and also sodium carbonate, separating the carbonate from the stannate, and recycling the carbonate to the first mentioned reaction step to react with an additional quantity of tin oxide.

No. 2,475,288, Fungicides and Insecticide, patented July 5, 1949 by Elbert C. Ladd, Passaic, N. J., assignor to United States Rubber Co., New York, a corporation of New Jersey. A fungicidal composition is patented comprising an aqueous suspension of

a 4a,5,8,8a-tetrahydronaphthalenedione-1,4, said aqueous suspension containing a dispersing agent.

No. 2,475,629, Method of Pest Control, patented July 12, 1949 by Edmund R. Meincke, Stamford, Conn., assignor to American Cyanamid Co., New York, a corporation of Maine. The patent describes a method of protecting materials from insects, fungi and bacteria which comprises applying to said materials a pest control composition containing as an essential active ingredient an alkyl ester of a member of the group consisting of aconitic acid, its homologues and its isomers.

No. 2,476,235, Fungus-Proofing Composition, patented July 12, 1949 by Paul George Benignus, Belleville, Ill., assignor to Monsanto Chemical Co., St. Louis, a corporation of Delaware. A fungus-proofing composition for the treatment of cellulosic substances is covered comprising a water-in-oil emulsion in which the ratio of water phase to oil phase is in the range of 1:4 to 4:1, said emulsion having an oil phase comprising ½-5% of a water-insoluble fungicidal agent selected from the group consisting of water-insoluble salts of 8-hydroxyquinoline and of pentachlorophenol, 2-10% of an oil-modified alkyd resin made from a polyhydroxy alcohol, phthalic anhydride and a modifying substance selected from the group consisting of fatty oils and fatty acids, said resin containing 20-40% of phthalic radical calculated as phthalic anhydride, said resin being soluble in mineral spirits, 3-25% of a chlorinated diphenyl mixture containing from 20-68% of chlorine, and mineral spirits.

No. 2,476,281, Polishing Composition, patented July 19, 1949 by William Collins Brinton, Harper, Wash. A polishing composition is described the major constituent, at least, of which consists of a substantially moisture-free solution of rat fish liver oil and a light hydrocarbon liquid in the proportion by volume of eight parts of the hydrocarbon liquid to from one to forty parts of the rat fish liver oil.

No. 2,476,514, Double Salts of Nicotine, patented July 19, 1949 by Claude R. Smith, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of Agriculture. An insecticidal and fungicidal agent is covered comprising a nicotine complex salt of the formula $MX_n \cdot n(C_{10}H_{14}N_2 \cdot HX)$ in which M is a polyvalent coordinating metal taken from the group consisting of copper, zinc, nickel, cadmium, iron, and cobalt; n is 2, or 3; and X is a radical of the group consisting of —CN and —CNS, both X's being identical; n being the valence of the metal M.

No. 2,477,550, Separation of the Components of Polyglycerol Mixtures, patented July 26, 1949 by Harold Wittcoff, Minneapolis, Minn., assignor to General Mills, Inc., a corporation of Delaware. Di-isopropylidenediglycerol.

Napalm Composition

Napalm is not a pure disoap but contains about 10 per cent of impurities in the form of moisture, inorganic, and extractable materials. Also the disoap itself does not stem from a pure fatty acid but from a mixture of oleic, coconut, and naphthenic acids. The average molecular weight of these of 233 however, is, only 15 per cent higher than that of lauric acid; the content of lauric acid has been estimated at 60 per cent. Aluminum dilaurate, whose study as a definite compound is much easier than that of Napalm, serves as an excellent model for this product. K. J. Mysels, *Ind. Eng. Chem. 41*, 1435-8 (1949).

FATTY ACIDS

(*From Page 42*)

acid is given in Figure 6.

The high degree of unsaturation of this material, plus the fact that naturally occurring oleic acid exists in the *cis*, or folded form, explains the high degree of solubility of its soaps. Liquid potash soaps containing 18-22 per cent real soap are easily prepared. These soaps are excellent detergents, lather quite rapidly, and produce a large quantity of stable suds. Because of the presence of oxidizable double bonds, however, oleate soaps have a tendency to rancidify and darken in color.

Mixed fatty acids from coconut oil are also very important liquid soap raw materials. The high percentage of low molecular weight fatty acids confers the properties of rapid and profuse sudsing, so important in the manufacture of shampoos, effective detergency at relatively low temperatures, and high soap solubility. Coconut soap lather though profuse is somewhat unstable, compared with soaps of higher molecular weight fatty acids. Similarly, detergency is poorer. However, solubility is greatly enhanced. Real soap concentrations as high as 38 per cent may be processed and the product will still retain its liquidity.

Coconut acid composition favorably affects soap stability. The fact that a very low percentage of unsaturated fatty acids is present means that color and odor are less affected by aging than oleate soaps.

The short chain acids naturally present in mixed coconut fatty acids, of course, have been a subject of controversy in regard to dermatological effects. Certain experiments which have been reported presumably trace skin irritation to soaps of lower molecular weight acids in coconut oil, but other research workers in the field are at variance with this report. At any rate, there are on the market today "topped" coconut acids from which the lower molecular weight fraction (below C_{12}) has been predominantly removed by fractional distillation.

FIGURE 6
Fatty Acid Composition

Fatty Acid	Oleic	Coconut	Liquid Vegetable	Cottonseed	Soya
Caprylic		8			
Capric		7			
Lauric		48			
Myristic	5	17		Trace	1
Palmitic	3	9	2	23	17
Stearic	Trace	2	1	9	8
Oleic	79	6	45	28	26
Linoleic	11	3	50	39	43
Linolenic	2		2	1	5

Among the wide variety of vegetable fatty acids, those of cottonseed and soyabean origin are most common. There are two general types, the straight distilled acids and the liquid fractions produced by fractional distillation or solvent separation. Straight cottonseed and soya fatty acids have rather similar compositions (see figure 6), though soya has a slightly greater proportion of unsaturated fatty acids. This contributes to a higher degree of solubility of the soya soaps.

Soaps of straight soya and cottonseed fatty acids are mild and nonirritating and are quite good detergents. Their chief disadvantage is their lack of stability, as reflected in high iodine values. Both color and oxidation stability can be classed only as "fair."

The liquid vegetable fatty acids, typified by the composition illustrated in figure 6, are prepared by separation of the majority of the solid, or saturated, acids from the mixture of split acids. Properties of this type of acid resemble oleic. Surprisingly enough, the increased linoleic content does not contribute to greater solubility, as the soap solubility is of the same order as of the oleates.

In this discussion soap solubility has been emphasized, as this is one of the points of unusual interest to liquid soap manufacturers. Figure 7 shows comparative maximum solubilities, in terms of per cent real soap, for soda and potash soaps of certain commercial varieties of fatty acids. These data are for soaps at room temperature (approximately 75°F.).

Ranges are given for these real soap data since each soap passes through stages of increasing viscosity up to the gel point. Thus, on the high side of these ranges the soap solutions may be slightly thickened.

Except in the case of the coconut soaps, the potash derivative is more soluble than the soda soap. We have found also that up to 50 per cent oleic acid can be blended with coconut fatty acid without increasing the viscosity of the resulting soap significantly. Certain vegetable fatty acids, particularly the liquid fractions, perform similarly. Of course, there are several ways of increasing soap solubility and varying viscosity, such as using certain solvent additives, and these are well known in the soap industry.

These data can be considered only somewhat approximate, for there are natural variations in the fatty acid raw materials which may influence solubility and viscosity significantly. Two of these variants are unsaponifiable content and state of oxidation. The effect of varying unsaponi-

(*Turn to Page 147*)

FIGURE 7
Maximum True Liquid Soap Concentration Possible Using Various Fatty Acids and Alkalis

Fatty Acid	Titer, °C.	Iodine Value	Saponification Value	Percent Real Soap	
				Soda	Potash
OLEIC	3-5	91-95	197-203	14-18	18-22
COCONUT	22-26	8-18	257-268	35-38	35-38
LIQUID VEGETABLE	3-5	135-155	192-198	16-20	18-22
COTTONSEED	34-38	90-110	197-203	<10	15-20
SOYA	25-30	115-135	195-203	12-14	15-20
50% COCONUT 50% OLEIC	13-15	50-56	227-235	35-38	35-38

SANITARY PRODUCTS
A SECTION OF SOAP

TRENDS in modern food processing establishments for insect control are away from the use of insecticides and more in the direction of preventing the start of infestations through scrupulous cleanliness, we have been told. Possibly scare-head DDT publicity early this year and subsequent warnings by the Food and Drug Administration regarding the presence of insecticide chemicals in foodstuffs may have a bearing in accentuating this trend, although such were not responsible for its start. The idea of never having a bug in the plant by never permitting a bug or egg to enter is not a new philosophy of insect control. The difficulty has always been to make the idea work. However, more recent changes in plant and equipment design and layout, and new cleaning methods, particularly expanded use of vacuum cleaning, bring practical success nearer.

With changes in insect control in processing plants, insecticides eventually might be outmoded. But, there are thousands of plants wherein the old problem remains, where the very character of the operations means insects will get in and multiply. They must be kept down, even though rarely can they be wiped out. The problem of insects in stored foods beyond the confines of controlled areas is likely to be with us for many years to come. But, the overall trend is still away from insecticides and toward other methods in the food field. Elsewhere, we believe the tendency is to expand the use of insecticides as the result of a growing intolerance to the presence of any insect. However, this does not alter the fact that the food processing industry, for many years one of the largest users of insecticides, may eventually be lost as a customer,—which may be something for insecticide manufacturers to think about.

RECENT low quotations on government bids for floor waxes have aroused the ire of some wax manufacturers. Their contention is that the products cannot be made to meet government specifications and sold at the prices quoted. But their main gripe appears to be that the lowest quotations, not only in this recent instance but in previous ones as well, are supplied by unknown bidders, that is firms previously unheard of by them and believed by them not to be manufacturers of floor waxes. They contend that these low bidders are either jobbers or else dummies for certain manufacturers who for one reason or another do not want their names to appear. Or, as it has also been contended, the manufacturer quotes a high price under his own name and really goes after the business with a low figure via his dummy supplier.

As far as we can see, no law or ethical code is violated if a manufacturer chooses to bid through a dummy. The practice is as old as the hills. If he is willing to quote a low price and does not want his competitors to know who is doing the quoting, this appears to be completely within his rights. All he has to make sure of is that his product meets the specification. For the implication that the too-low bids fail to meet specifications is quite apparent. From this angle, these gripes cannot be brushed off idly by purchasing agencies.

Effect of drying methods on toxicants in

Pyrethrum Flowers

By M. S. Lowman,[1] W. A. Gersdorff[2] and J. W. Kelly[1]

U. S. Department of Agriculture,
Agricultural Research Administration

PYRETHRUM growers have found the drying of the flowers to make them comply with accepted trade standards a major problem especially in localities where weather conditions are likely to be unfavorable at harvest time. Before reliable methods of evaluation were developed the trade became accustomed to associating effectiveness of the flowers with the normal light yellow color produced by sun or shade drying. This association of appearance with toxicity has become so well established in trade practices that growers would have difficulty in selling dried flowers of poor appearance regardless of their insecticidal quality. Since reliable chemical and biological tests for accurately determining insecticidal value have long been available, physical appearance of the flowers need no longer be a very important criterion of value.

The familiar yellow insect powder for household use can be prepared only from bright yellow dried flowers and the consumer would probably have no confidence in a product of any other color. However, in the manufacture of dusts and spray extracts, the effectiveness of the product should be the only consideration, and for this purpose flowers of satisfactory toxicity should be acceptable regardless of their physical appearance.

When large quantities of flowers are harvested in a short period, circulating air, heated to about 60° C. (140° F.), must be provided to produce the normal colored flowers required by the trade. At this temperature considerable time is required to dry the flowers and the capacity of the drying equipment is thus greatly reduced. The handling of the flowers from even a few acres is therefore a serious problem because the harvest must be completed during the few days when most of the flowers are at the preferred stage of development.

In the commercial production of pyrethrum it has usually been the aim to dry the flowers at temperatures not greatly exceeding 140° F. because it has been generally understood that at higher temperatures a loss of pyrethrins occurs and the desired color cannot be obtained. The published results of some of the experimental work that has been done to determine the effect of certain temperatures and other factors on the color and pyrethrin content of the flowers indicate that loss of pyrethrins occurs when the temperatures used are high enough to dry the flowers very rapidly. However, preliminary experiments conducted by the writers gave contrary indications. Moreover, a commercial manufacturer of pyrethrum insecticides dried an experimental lot of flowers for 90 minutes at about 200° F. in a commercial Proctor and Schwartz drier of the type used in drying and conditioning tobacco with no effect on the pyrethrin content or toxicity as deterrmined by standard methods.[3]

In view of these observations it seemed advisable to subject the flowers to treatments much more severe than any used in the experiments reported in the literature to determine the effect of such treatments on appearance, pyrethrin content and toxicity. This paper reports the results of the experiments conducted for this purpose.

Review of the Literature

THE results of experimental work on drying pyrethrum flowers as recorded in the literature show in general that one aim has been to dry the flowers by means that will produce a product similar in appearance to that obtained by normal shade or

[1] Tobacco, Medicinal and Special Crops, Bureau of Plant Industry, Soils and Agricultural Engineering.
[2] Control Investigations, Bureau of Entomology and Plant Quarantine.

[3] From correspondence with W. A. Simanton, Gulf Research and Development Company, Pittsburg, Pennsylvania, 1941.

sun drying. This has been made necessary because, as stated, the trade demands flowers of a bright yellow color as well as of satisfactory pyrethrin content and toxicity. Gnadinger, Evans and Corl (8) in a preliminary report in 1933 on factors affecting pyrethrin content stated that flowers dried in the shade, sunlight and in a thermostatically controlled oven at 35° to 40° C. with forced air circulation and under vacuum did not vary significantly in pyrethrin content.

In 1936 Acree, Schaffer and Haller (1) while studying the effect of drying conditions on the pyrethrin content and toxicity of fresh flowers, found that the pyrethrins were not affected by enzyme activity and moisture in the process of drying. When fresh flowers were subjected to 120° C. at 15 pounds pressure for two hours in a steam sterilizer and subsequently dried at 40°-45° C. for 24 hours, no material effect on pyrethrin content was found. Jary and co-workers (9) in 1937 report that no loss of pyrethrins occurred if flowers were dried in a specially designed steam heated drier at or below 60° C. with forced air circulation, but that there was apparently some loss of pyrethrins if the flowers were dried at 68° C. and above. Culbertson (6) found that sun or shade drying for as long as 330 hours or oven drying at 105° to 110° F. for 72 hours did not appreciably affect pyrethrin content of the flowers.

While investigating the oxidation activities in pyrethrum flowers at two stages of development, Covello (5) in 1940 found that drying the flowers in an oven at 60° and 100° C. caused appreciable loss of pyrethrins, but that when dried in the sun or shade, in a dessicator under partial vacuum or in a current of air at 30° to 38° C. no loss of pyrethrins was observed. In an account of pyrethrum culture in Kenya, Ball (2) in 1943 stated that it is important that flowers be picked when there is no external moisture on them because heating caused by such moisture, would be deleterious to the appearance and pyrethrin content of the dried flowers. It is recommended that the flowers be picked in wicker baskets that permit access of air at the sides to prevent heating. No chemical or biological datum is given regarding the relation of heating or discoloration to the pyrethrin content or toxicity of the dried flowers. Pyrethrum drying experiments conducted in Kenya in 1944 by Beckley and McNaughtan (3) showed that the pyrethrins are not affected by quick drying in the sun but slow drying in the sun or shade causes material losses. Drying the flowers in an oven at 50° C. with forced air circulation had no effect on the pyrethrin content. But temperatures above 60° C. caused appreciable losses.

Experimental Methods

EXPERIMENTS were planned to show the effects on quality when fresh flowers are handled by the several methods that growers with limited facilities can adopt to get the flowers into marketable condition. Such methods would include (1) rapid drying with heated air in special equipment; (2) placing the flowers temporarily in deep layers on barn floors or in bins and then drying them slowly on screens, or as an alternative by arranging them in thin layers on floors or drying rapidly with heated air; (3) storing the flowers in sealed containers, such as corn in a silo, for an indefinite period and then drying them slowly or rapidly as circumstances permit.

The experiments were made during the flowering periods in 1945 and 1946. Those in 1945 served to indicate in a general way the effects of the treatments used. The experiments in 1946 were intended to provide further evidence of the effects of the treatments, and they differed only in minor details from those of the year before. The supply of fresh flowers available from the experimental pyrethrum plots at the Plant Industry Station at Beltsville, Maryland, was so limited in both years that it was necessary to make several pickings in order to obtain enough flowers at the preferred stage of development for the experiments planned. Each picking included only flowers at the stage when one half to two thirds of the disc florets were open. The flowers from each picking were thoroughly mixed and separate lots used for the different treatments and controls. Flowers of the control lots were dried in about seven days on screens in subdued light in an airy room. Other lots were dried rapidly at various temperatures up to 175° C. in a thermostactically controlled, electrically heated, forced-air oven. Flowers that were not to be dried immediately were placed in bins or boxes in various depths for varying periods and then dried on screens or divided into several lots for slow or rapid drying in the oven. Each year one lot was packed firmly into a glass jar immediately after picking, the lid sealed and the jar stored in the dark. In the first year, after 150 days, the flowers were removed and dried slowly on screens like the control. In 1946, the flowers, similarly packed, were removed after 70 days, some dried slowly on a screen and the remainder rapidly at 150° C.

The several lots of dried flowers obtained in these experiments were stored in paper bags in the laboratory until their pyrethrin content and toxicity could be determined about four months later. After this period the flowers contained about seven percent moisture, which was removed in four hours in a vacuum oven at 100° C. and the flowers then ground to a 40 mesh powder. Pyrethrins I and II were determined as described in Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, 6th Edition, 1945. According to LaForge and Barthel (10) the related but more stable constituents, cinerins I and II which they found in pyrethrum flowers are determined by this method along with pyrethrins I and II. The cinerins have been shown by Gersdorff (7) to be a little less toxic than the pyrethrins.

All Lots Tested Biologically

BECAUSE it was not known if, or to what extent, the unusual treatments given the flowers affect the ratio of these four constituents, or their toxic value, it was deemed necessary to test extracts of all lots biologically. For the preparation of these extracts, 10 gram samples of the ground, moisture-free flowers were extracted with petroleum ether, the solvent removed with gentle heat and the resi-

due dissolved in refined kerosene. These kerosene extracts were all made up to the same concentration of total pyrethrins, based on the chemical assay, so that they would produce mortalities on a comparable basis. The tests were made by the Campbell turntable method (4) on houseflies, *Musca domestica L*, reared by standard methods. The mortalities recorded in table 1 for each extract are averages of one day counts of eight daily replications in each of which approximately 100 flies were used. In 1945 the concentration was 1 mg. of total pyrethrins per ml. of solution, since this is a common concentration used for such comparisons. However, due to the greater resistance of the flies in late fall when the tests were made, the mortalities were too low for the most conclusive comparisons. The following season the extracts were similarly prepared but in a concentration of 2 mg. of total pyrethrins per ml. of solution in order to get higher mortalities.

When the mortalities obtained by the extracts made from the treated flower samples in a group of experiments do not differ significantly from those obtained with the extract prepared from the flowers dried slowly on a screen as a control it is evidence that the pyrethrin content as found by assay is a true measure of the insecticidal value. There is no possibility in such cases that false evaluations of the toxicants in the flowers have been obtained by chemical assay where the flowers were subjected to high temperatures or other severe handling procedures.

Discussion of Results

THE methods of handling the flowers before and during the drying process, the pyrethrin content of the dried flowers and the per cent mortalities of the extracts with houseflies are shown in table 1. The treatments are arranged in three general groups representing the studies conducted in both seasons. Numbers are assigned to the separate lots for convenience in referring to the results of each treatment. The following discussion deals with the effects of these treatments on the pyrethrin content of the dried flowers as indicated by chemical assay corroborated by biological tests.

The first group involves rapid drying of the fresh flowers immediately after picking at temperatures that generally have been believed damaging to the toxicants present. Lot 2, dried at 130° C. for one and three-quarters and lot 17 dried at 150° C. for one and one-half hours contained, respectively, 0.11 and 0.10 per cent less total pyrethrins than their controls. (Differences up to 0.05 per cent between duplicates may be considered within the range of error for the assay method.) On the other hand both lots 7 and 18, subjected also to high temperatures, contained 0.08 per cent more pyrethins than their controls. The other treatments in this group resulted in smaller indicated differences in pyrethrin content. The percentages of mortalities with houseflies produced by the extracts from the treated flowers were in no case significantly lower than those produced by the extracts from the controls.

The second group of experiments was designed to show to what extent if any the pyrethrin content or toxicity of flowers is reduced when they are kept in a rather thick layer for several days before drying. The necessity for such handling of the flowers could arise if considerable quantities are harvested in a short period, as would be the case if a mechanical harvester were used and drying facilities limited. Experience has shown that in layers more than a few inches deep the flowers heat, sweat, and mold, especially if poor drying weather prevails and they are not stirred frequently. It has been generally assumed that this results in a reduction of the insecticidal value of the dried flowers. However, the results of this group of treatments indicate that no damage is done except under conditions where severe molding occurs with full exposure to the air.

Control lot 8 of flowers picked on June 13, 1945 was dried on a screen. Lot 9 was stored at room temperature for 5 days in a 12x12x10 inch closed cardboard box completely but loosely filled. At the end of this storage period the outer flowers were very moldy while the flowers toward the center of the mass were only slightly moldy. Another portion was separated into two lots: 9A, slightly moldy; and 9B, very moldy. Both lots were spread on screens to dry, but molding did not continue as in the other lots in this group of treatments which were held in layers in an open bin and a wooden box. Perhaps a different species of mold developed in the closed cardboard box, or possibly weather conditions prevailing at the time lots 9A and 9B were drying on screens in the open air were unfavorable for mold growth. These two lots which had molded quite severely in the closed cardboard box did not lose pyrethrins nor did the results obtained with their extracts on flies indicate any significant loss of toxicity.

Flowers Mold in Layer

ANOTHER quantity of flowers picked six days later was divided into three lots. The first, lot 10, after drying on a screen as a control contained 0.95 per cent pyrethrins. The second, lot 11, was held six days in a two and one-half inch layer and then dried on a screen. The flowers molded severely while in the layer and the molding continued for some time after spreading on the screen. The pyrethrin content was reduced to 0.69 per cent. The third, lot 12, was kept in a five inch layer in a wooden bin from which portions designated A, B and C were removed after three, four and six days, respectively. The flowers were molding slightly when portion A was removed. One half of this portion, (12A-1), after drying slowly on a screen during which molding continued for some time, contained 0.70 per cent pyrethrins. The other half, (12A-2), after being dried rapidly at 150° C. contained 1.03 per cent. The flowers in the bin continued to mold. Portion B, removed after four days, and dried slowly on a screen contained 0.79 per cent pyrethrins, while portion C removed after six days and similarly dried contained 0.82 per cent. The dried flowers in all the treated lots in this group were much darker in color than those in the control lots.

In 1946 the effect of holding the fresh flowers for several days in a

TABLE 1. The insecticidal value of pyrethrum flowers as affected by various treatments.

Treatment Group	Date of Picking	Lot No.	Detail of Treatment	Percent of pyrethrins in dried flowers: Four months after treatment I	Four months after treatment II	Four months after treatment Total	One year later Total	Percent mortality of extract to houseflies in 1 day at concentrations of—[1] 1 mg/ml	2 mg/ml
1. Dried rapidly immediately after picking	5/31/45	1	Control: air dried on screen	0.82	0.42	1.24		8.3	
		2	1¾ hours at 130°C.	.74	.39	1.13		8.5	
		3	Control: air dried on screen	.67	.42	1.09		11.7	
	6/6/45	4	½ hr. at 130°C., then 5½ hrs. at 70°C.	.71	.36	1.07		9.3	
		5	½ hr. at 130°C., then 22 hrs. on screen	.72	.35	1.07		10.9	
	6/21/45	6	Control: air dried on screen	.61	.39	1.00		11.4	
		7	4½ hrs. at 50°C., then 2 hrs. at 150°C.	.69	.39	1.08		15.4	
	6/10/46	15	Control: air dried on screen	.60	.40	1.00	0.95		32
		16	2½ hours at 120°C.	.60	.34	.94	.99		34
		17	1½ hours at 150°C.	.59	.31	.90	.85		37
		18	1 hour at 175°C.	.66	.42	1.08	.97		33
2. In thick layer several days before drying	6/13/45	8	Control: air dried on screen	.62	.41	1.03		11.3	
		9	In full closed cardboard box 12x12x10 inches for 5 days, then dried on screens						
			A. Slightly moldy portion	.65	.37	1.02		7.2	
			B. Very moldy portion	.72	.43	1.15		7.9	
	6/19/45	10	Control: air dried on screen	.60	.35	.95		8.9	
		11	In bin in 2½ inch layer 6 days, then dried on screen[2]	.50	.19	.69		4.7	
		12	In bin in 5 inch layer:						
			A. After 3 days dried:						
			1. On screen[2]	.43	.27	.70		5.0	
			2. At 150°C.	.60	.43	1.03		15.9	
			B. After 4 days dried on screen[2]	.51	.28	.79		5.5	
			C. After 6 days dried on screen[2]	.57	.25	.82		7.8	
	6/17/46	19	Control: air dried on screen	.64	.34	.98	.85		34
		20	In full wooden box 12x12x20 inches for 72 hrs., then dried;						
			A. On screen[2]	.47	.26	.73	.68		34
			B. At 150°C.	.63	.37	1.00	.76		30
3. In sealed jar for long period & then dried	6/13/45	13	Control: air dried on screen	.62	.41	1.03		11.3	
		14	Packed in glass jar, sealed and stored in dark for 150 days, then dried on screen	.63	.37	1.00		14.6	
	6/7/46	21	Control: air dried on screen[3]	.75	.47	1.22	1.08		22
		22	Packed in glass jar, sealed and stored for 70 days in dark, then dried:						
			A. On screen	.65	.31	.96	.95		30
			B. At 150°C.	.67	.30	.97	1.00		29

[1] In the 1945 studies a standard kerosene extract prepared from commercial flowers gave mortalities of 10 and 34 per cent at concentrations of 1 and 2 mg. of pyrethrins per ml. and control lot No. 3 gave mortalities of 12 and 34 per cent. In the 1946 studies the standard gave mortalities of 14 and 33 and the control lot No. 15, mortalities of 18 and 32 per cent. At concentrations of 1 and 2 mg. of pyrethrins per ml. differences in mortalities of 5.3 and 6.3 per cent, respectively, are required to show significance at odds of 19:1.

[2] Molding continued for some time after spreading on the screen to dry.

[3] The corrected per cent pyrethrins as explained in the text under discussion of results is: I, 0.65; II, 0.40; total, 1.05.

thick layer before drying was again determined. The control lot 19, dried on a screen, had a pyrethrin content of 0.98 per cent. Thirty pounds of the fresh flowers were firmly packed to fill completely a 12 inch deep 12x20 inch open wooden box. The initial temperature at the center of the mass was 30° C. After 24, 48 and 72 hours temperatures of 44°, 35° and 42° C., respectively, were observed. During this period the weight of the lot was reduced one pound. The flowers at and near the top had somewhat dried and some molding had taken place along the sides and bottom of the box. Elsewhere the flowers had undergone very

(*Turn to Page* 151)

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ANIMAL REPELLENTS

By Milton A. Lesser

THOSE who are interested in the development and marketing of new products might do well to look into the possibilities of animal repellents. There are great potentialities in this field. This is true, not only in the case of products to deter house pets from doing harm, but also with respect to newer types of materials to repel destructive wildlife.

Of course, there has long been considerable interest, with perhaps too little research, in means for preventing dogs and cats from committing nuisances in various places about the house or grounds. During recent years, however, increasing attention has been focused on the use of deterrents as a means of reducing damage caused by field animals and by rats and mice. That there is a need for effective products for this purpose is evident in the fact that damage estimated at billions of dollars is caused by rats and mice each year. Garden and crop damage, as well as injury to valuable trees by raiding field animals, accounts for many million dollars more.

In the main, the various types of repellents depend upon the use of odoriferous materials that are repulsive to animals, but are not necessarily unpleasant to humans. The use of these obnoxious odors is intended, of course, to make the animals avoid the places where the repellents are applied. With the introduction of newer types of repellents, the mechanisms by which they work have also been varied. For gnawing and chewing animals, as contrasted to digging and clawing animals like dogs and cats, the materials to be protected are rendered unpalatable by the use of various compounds. To the purely mechanical methods, such as flying streamers, air-filled bags and bright mirrors, are being added other physical devices for scaring off harmful pests. The value of color as a repellent factor is being investigated. The use of various irritants is also worth consideration.

Animal repellents are provided in a number of forms. These include liquids (generally used as sprays), powders, paints, smears (e.g., pastes) and vaporizing molded blocks. A recent innovation is a wick type product which disperses the repellent into the outdoor air in the same manner as do similar indoor air deodorizers. The unit is mounted on a stake.

Two Main Types

ANIMAL repellents may be divided into two broad categories. The first includes products intended to keep dogs and cats away from places where they are not wanted. The second group, which is of greater economic importance and the one currently receiving the most attention, comprises compounds which will deter animals, particularly various rodents and deer, from injuring garden and field crops, young trees, and valuable orchards and from damaging stored products. A third group might also be mentioned. This includes means for preventing birds, notably pigeons, from defacing buildings, walks and such with their droppings. It also includes methods for dissuading birds from making off with rodent baits.

Obviously, the first group finds its market among the millions of pet owners in this country. Whether in a city apartment or in a suburban bungalow, these people frequently seek a product that will keep their cat or dog from shedding on the furniture and rugs and from imparting an animal odor to various parts of the house. Superintendents of buildings, householders, and amateur gardeners are among the many potential customers for items that will keep animals away from fence and gate posts, from walls, porches, and garbage pails, from trees and shrubs, and out of lawns, flower beds and vegetable plots.

Some of the repellents on the market, whether for indoor or outdoor application, are marketed for use in deterring only one kind of animal. Many, however, are described as being capable of repelling both dogs and cats. A few also claim to provide an action against rabbits which cause damage to gardens and trees in some localities. From the standpoint of sales volume and potential demand, the most important repellents are those intended for outdoor use against dogs.

Although few products can be said to meet these standards, the requirements of a dog repellent for outdoor use have been cited in a mar-

ket report (1) on such items. Here it is stated that the ideal product should possess an odor which cannot be tolerated by the extremely sensitive olfactory mechanism of a dog, but which should not be disagreeable to the less acute smelling apparatus of humans. The active ingredients should be stable and provide a lasting effect during hot or cold and wet or dry weather conditions.

It should not require frequent replacement. To this end the product must not be water-soluble, so that it can stand up under the effects of rain, hosings, watering cans and sprinklers. Nor should the active ingredient be excessively volatile. The repellent should not be dangerous or toxic to either humans or dogs. The product should not be injurious to trees or shrubs, nor should it stain marble, stone or other building materials when used in the necessary concentrations. Another requirement is that its repellent action must be discernible to the animal at a reasonable distance from where it is applied.

Many attempts have been made to formulate effective repellents for outdoor use. Old-time compounds made use of such materials as nicotine sulfate, formaldehyde, and naphthalene. Although the value of nicotine sulfate is open to question, its employment as a dog nuisance preventer has been mentioned in several reference texts. In one case,(2) it is suggested that a solution of ¼ ounce of nicotine sulfate per gallon of water be sprayed on the bases of bushes and shrubs to prevent injury to these growths by dogs. In another instance (3), it is recommended that a solution made from 1½ teaspoons of "Black Leaf 40" in one gallon of water be used in the same way.

A British text (4) suggests that a spray made from one part of formaldehyde solution and three parts of water is useful as a dog deterrent. An American source (2) mentions the application to trees and other surfaces of a thin tragacanth mucilage containing about two per cent of formaldehyde. It is quite probable that this agent is sufficiently disagreeable and irritating to keep dogs at a safe distance. However, the unmasked odor of formaldehyde is hardly pleasant to human nostrils either.

Naphthalene finds rather frequent mention, not only as a repellent for dogs, but for certain other animals as well. While it is conceded that naphthalene may have some effectiveness in a confined space, there are those who doubt its value in the open, where the vapors can be dispersed rapidly. Evaporation can be slowed up somewhat by incorporating the naphthalene in special bases, as in the following example: (2)

Naphthalene flakes	4 oz.
Paraffin wax	¼ oz.
Rosin	¼ oz.
Gasoline	1-2 pt.

Stir until dissolved and use as a spray for the bases of tree trunks or shrubs.

Another type of product which utilizes both naphthalene and an essential oil as repellents is made from:

Paraffin wax	1 part
Naphthalene	1 part
Mustard oil	⅛ part

Melt the first two ingredients together and stir until uniform. When the mixture begins to cloud, add the oil.

A more modern product of this general type makes use of molded paradichlorobenzene. This is described (1) as a tube containing a solid paradichlorobenzene casting. When the tube is hung in position and the end is cut away, exposing the contents to the air, the active agent evaporates slowly. The released vapors are heavier than air and permeate the surrounding area for a radius of about 15 feet. It is claimed that a product of this sort will last for about three months.

Other products, in paste-like form to provide prolonged action, can be made with suitable combinations. Thus a quite modern dog chaser for shrubs and the like may be made from: (2)

Petrolatum	30 parts
Lanolin	10 parts
Amylmercaptan	5 parts

If desired a liquid preparation containing amyl mercaptan (1-pentanethiol) as the active ingredient may consist of:

Isopropyl alcohol	89 parts
Anhydrous lanolin	5 parts
Amyl mercaptan	10 parts
Creosote	2 parts

Sprayable Liquids Popular

As a matter of fact sprayable liquids are the most popular form of dog repellent for outdoor use. Although the compositions of many products on the market are considered trade secrets, it is known that many of them consist of essential oils and related compounds in a diluent such as alcohol. Among the materials that have been used, alone or in combination, are pine oil, terpineol, oil of mirbane, oil of mustard, synthetic oil of mustard (allyl isothiocyanate), oil of citronella and others. After evaporation of the solvent or vehicle, the residual essential oils, which are not water-soluble, are able to withstand the action of rain for quite a while. In due time, of course, the repellent will be washed away or will disappear through evaporation.

It has been stated (1) that the modern trend in the formulation of liquid type dog repellents is based on solutions of essential oils in alcohol. Indeed, one of the first products available on the general market—one that was reasonably effective as a dog repellent—is said to have contained synthetic mustard oil as its active ingredient. The compound was sold as a dilute solution of the oil in denatured alcohol.

Oil of citronella has long been recommended as an efficient dog deterrent (4). In fact, many liquid preparations now on the market contain various proportions of this oil as an active ingredient. One widely advertised product is known to consist solely of citronella oil in alcohol.

Liquid repellents for indoor use are not as popular as they might be because people are afraid of staining and discoloration of furniture fabrics, rugs and drapes. However there is at least one liquid product on the market which is guaranteed not to stain and to be harmless to furniture and fabrics.

Powdered preparations are generally used indoors as means of keep-

Utilizing materials with a bad smell or taste, animal repellents are compounded from nicotine sulfate, formaldehyde and naphthalene. The two main types are used for pets and field pests.

ing cats and dogs off furniture and away from various parts of the house. Nonetheless there are those who consider certain powdered preparations as being quite effective out-of-doors. For example, there are those who swear by red pepper, also known as Cayenne pepper or capsicum, as a means of controlling dogs. For this purpose, the powdered material is sprinkled liberally around the places where the animals commit nuisances. Similarly useful is a mixture of equal parts of powdered capsicum and strong powdered mustard.(1)

Of a quite different nature are preparations used (4) in Europe for deterring dogs from urinating in front of shops, buildings and other places. These consist of compounds which elvolve gases that are obnoxious to the animals. For this purpose, freshly powdered ammonium carbonate may be sprinkled about the area to be protected, or the following mixture may be used:

Sodium bisulfite	4 parts
Tartaric acid	1 part

Despite the number of preparations on the market, there is considerable need for study to provide better and more efficient repellents for use about the house and grounds. Useful information may come eventually from investigations being carried out by government agencies, often done in collaboration with private industry, on methods of controlling the depredations of wildlife by means of repellents.

Deterrents for Crops

AS pointed out by Kalmbach (5), even before the war increasing importance was being placed on the use of deterrents as a means of reducing crop and tree damage by field animals. The war provided a strong stimulus to the work and hundreds of compounds were investigated. Particular stress was laid on the study of repellents for rats, mice, gophers and other animals that damage stored foods, communication lines and other goods essential to the war effort. Kalmbach concedes, however, that despite the progress made, there is much yet to be done in the field of animal deterrents. Actually, not much has been published on the subject of animal repellents. This, it has been explained (6), is probably due to the negative nature of most of the tests.

An interesting observation in this connection is Sparhawk's (7) remark that repellent is still a new word in the pest control industry. Extermination and control, says he, are understood, but it is not generally known that there are substances which can drive rodents out and keep them away.

Most of the work already done has been concerned with the effects of various compounds on rodents, like rabbits, rats and mice, and on deer. From the available data, it would appear that for these animals the sense of taste plays as important a role or even a more important part than the sense of smell. In other words, the effectiveness of many repellents for wildlife depends on their ability to make the treated materials unpalatable to the animals.

Considerable study has been devoted to repellents for keeping rabbits away from gardens, farm plots and orchards. However, there are a number of products which have long been employed, with varying degrees of success, to repel rabbits from gardens. According to one source,(4) a rabbit-scaring liquid can be made from a mixture of essential oil of camphor and oil of turpentine with paraffin oil. Also depending on the effect of an odorous material displeasing to rabbits is a product marketed by one of the leading producers of animal repellents. This is described as consisting of an essential oil dissolved in alcohol. When it is sprayed on foliage, grass or fences, the volatile alcohol acts as a dispersant for the oil, leaving a light even distribution of the active agent. It is claimed that this results in an effective repellency that lasts for from ten days to three weeks.

As noted in Cornell Extension Bulletin 729,(8) nicotine sulfate in the usual insecticidal strength is said to reduce rabbit injury when sprayed on plants every few days after rains. Another suggestion (9) for keeping rabbits from going on a rampage in gardens calls for the use of a solution of two teaspoonfuls of "Black Leaf 40" to one gallon of soapy water, or a soapy water spray made with brown laundry soap.

Various other materials that are supposed to be distasteful to rabbits find frequent use. Dusting with powdered lime when the plants are damp is one repellent measure, as is the liberal dusting of plants with powdered sulfur. A distasteful liquid spray is made from three ounces of epsom salts per gallon of water (9).

Of tremendous economic importance is the damage done by rabbits and certain other rodents to seedlings in reforestation projects, shelterbelt plantings, farm wood lots and orchards. Cooperative work to devise means for reducing losses resulted in the development of a rabbit repellent paint known as "96a." It consists of copper carbonate, copper sulfate and lime-sulfur as the active ingredient and a synthetic resin and asphalt emulsion dissolved in ethylene choloride as the adhesive. When applied to the bark of dormant trees, "96a" is effective in preventing damage by rabbits. According to Kalmbach, it is now being manufactured and sold to the public by the Fish and Wildlife Service at its Supply Depot at Pocatello, Idaho.

The manufacture of such a rabbit-repellent paint is described in a

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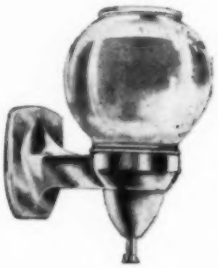

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publication (10) of this Service as follows:

A.	Heavy alkyd-type resin	4 lb.
	Ethylene dichloride	5 qt.
B.	Asphalt emulsion (any good grade	4 lb.
	Ethylene dichloride	5 qt.

Dissolve A and B separately before mixing. To the mixture add the following in small quantities with constant, thorough stirring:

Copper carbonate	5 lb.
Lime-sulfur (powder)	5 lb.
Ethylene dichloride	2 qt.

If the mixture is not smooth, let it stand for one or two days until it is homogeneous on stirring. It should be thoroughly agitated and then passed through a 16-mesh screen. It will then be of a consistency suitable for spraying on trees with a compression-type sprayer or for applying with a brush as a paint.

Especially noteworthy are the tests made by Cardinell and Hayne (11) on the scores of rabbit repellents that have been tried and recommended over years. In evaluating these coatings, which aim at making the taste of the tree bark so disagreeable that the animals will not eat it, the investigators divided the repellents into three groups on the basis of their efficacy and lack of injury to trees. All those present in the first or best group were included because they gave results as good as those obtained with a mixture of:

Rosin	2 parts
Ethyl alcohol	1 part

Other preparations, most of them quite simple combinations, which rated a position in Group I are as follows:

I	
Rosin	3 parts
Alcohol	2 parts
II	
Rosin	5 parts
Linseed oil	1 part
III	
Rosin	5 parts
Linseed oil	1 part
Gasoline	3 parts
IV	
Linseed oil	5 parts
Copper carbonate	4 parts

Rabbit repellent "96a" and Venice turpentine of normal consistency was also included in this group. Four proprietary rabbit repellents also rated a place in this category.

Rodent Repellents

ALL too familiar are the tremendous losses caused by rats and mice to farmers, food processors, warehousemen and householders. In addition to compounds for killing these rodents, investigators have also studied substances that will make these animals avoid the treated materials. Thus, during the war, microcrystalline waxes, used to waterproof packaged food, were found to be particularly effective in preventing rodent damage. Only where adverse storage conditions prevailed did rats gnaw through this protective barrier. Under dry or moderately dry storage conditions, the boxes were completely undamaged regardless of the contents. Other substances found to be of particular value in minimizing rodent damage when applied to food packages were waterglass (37 per cent sodium silicate solution) and prepared tung oil. (5)

In their report on a method for evaluating repellents, Bellack and DeWitt (12) suggested that such coating or impregnating materials might properly be termed "protectants." They felt that the term repellent should be used in referring to those materials whose chemical characteristics (e.g., odor, taste or irritancy) are such as to cause the rodents to avoid contact with objects containing them.

As pointed out in a government publication (13) on rat control, these animals appear to have a marked aversion for certain odors and consistently avoid them. For example, in seed warehouses and similar structures where sacked grain is stored, a liberal application of flake naphthalene scattered on the floor and over the bags will keep the rats away without harm to the seed. Because of its odor, this material is not recommended in places where food or foodstuffs are stored, unless the material is such that it can be thoroughly deodorized by airing before use. Among other compounds said to be objectionable to rats are creosote, carbolic acid and other coal-tar and wood-tar derivatives, kerosene and oils of peppermint and wintergreen.

Of decidedly related interest are the field tests made by Mills and Munch (14) on the use of repellents in rat control. Their work indicated that flake naphthalene was the best repellent. Carbolic acid, cedar-wood oil and creosote were also found to have merit.

Investigations by Ford and Clausen (15) have suggested the possibility of using mercaptans or similar substances to discourage the attacks of rats and mice on commercial foodstuffs. Compounds of this sort are present in the characteristic odors of weasels, skunks, ferrets and minks—all natural enemies of the rodents. To test this theory, these investigators placed the active ingredient of the odor of skunk, *n*- butyl mercaptan, on the food of caged white rats. The food remained untouched until the odor of the volatile mercaptan had disappeared. The animals displayed symptoms of fear, nervousness and excitement in the presence of the odor. Other volatile irritant compounds, such as carbon tetrachloride or denatured alcohol, had much the same effect but to a lesser degree. However, the effect of the odors on the rats diminished during the months in which the experiments were conducted. In a later discussion Sparhawk (7) recommended the use of an extract from skunk as a means of repelling rats.

Also worth noting in connection with odoriferous repellents is Barail's (16) recent statement that various odor measurement tests and taste tests enable prospective users of packaging materials treated with repellent to find the compound most suited to their individual needs and to the type of food being packaged.

In the previously cited government bulletin (13) it was noted that there are non-odorous compounds which rats avoid and which may be used where an odorous preparation would be objectionable. Among these are powdered sulfur, lime, lye and

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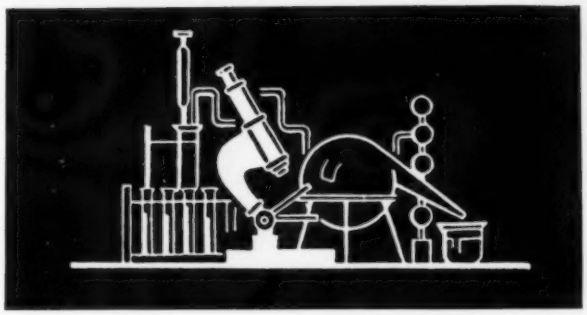
Examination of Wax Suspensions By Turbidimetric Methods



By M. E. Bolton and A. W. Marshall*
Wax Division, Petrolite Corp.

DURING the past few years industry has become familiar with the oxidation of various petroleum fractions, including the solid paraffins or petroleum waxes. These products have been successfully employed in many industrial fields, one of the most recent uses being that of the oxidized paraffins in water emulsion or "dry bright" polishes.

In attempting to produce oxidized waxes suitable for the manufacture of water emulsion polishes it became apparent that there was need for familiarity with emulsification technique and results. To make the most rapid progress there was a need for a systematic approach and for some form of quantitative evaluation of results. It was decided that information pertaining to the simple systems of oxidized petroleum wax, organic acid, base and water would be of the most direct value. This program was later expanded to include soap and borax as emulsifying agents.

The importance of particle size in the determination of various wax emulsion properties is well recognized. This value unquestionably affects the dry-bright quality of films laid down by polish emulsions (1, 2) and is related also to the stability of the emulsion. It was believed, therefore, that a rapid and simple means of estimating actual or relative particle size in various emulsion preparations would be useful in arriving at optimum values of the variables involved in polish preparation, and in providing a routine control method.

Measurement of light scattered by a colloidal sol provides a means of estimating weight average particle size of the dispersed phase, particularly where the particles are small in comparison to the wave length of light. (3) As usually employed for determination of absolute values of molecular weight or particle size, this method involves elaborate equipment and is rather time consuming. The present investigation was, therefore, directed to an exploration of the utility of a simple visual turbidimeter for characterizing polish emulsions. The simple turbidimeter used was a Parr Instrument type S-3 visual turbidimeter. This instrument actually measures the "extinction path length," or the depth of the solution through which a light source just fails to be visible. Turbidity and extinction path length are related by the expression

$$I = I_o e^{-rX}$$

where I_o is the intensity of the light source, I the intensity of the light beam after traversing a depth of solution or suspension, X is extinction path length, and r is the turbidity. The more the light is scattered by the suspended particles the smaller will be the length of the path (X) for a given value of I.

In using this instrument I_o is kept constant by careful regulation of the voltage on the lamp filament, and for a given observer I is essentially a constant for it is the intensity of light which the observer just fails to detect.

Turbidity and extinction path length are thus related as follows:

$$rX = \log I_o - \log I = k \qquad r = k/X \qquad (1)$$

where k is a constant.

The theory of light scattering (3) relates average particle weight of suspended or dissolved substances to the turbidity (for other than extremely dilute and ideal solutions) by the following equation:

$$\frac{HC}{r} = \frac{1}{M} + 2BC \qquad (2)$$

in which M is the average particle weight, B is the constant for the approximate osmotic pressure equation and H is defined as follows:

$$H = \frac{32\pi^3 n_o^2}{3N z^4} \cdot \left(\frac{n-n_o}{C}\right)^2 \qquad (3)$$

where N is Avogadros' number, z is the wave length of the incident light,

* Before 35th Mid-Year Meeting Nat. Assn. Insecticide & Disinfectant Manufacturers, Hotel Drake, Chicago, June 13, 1949.

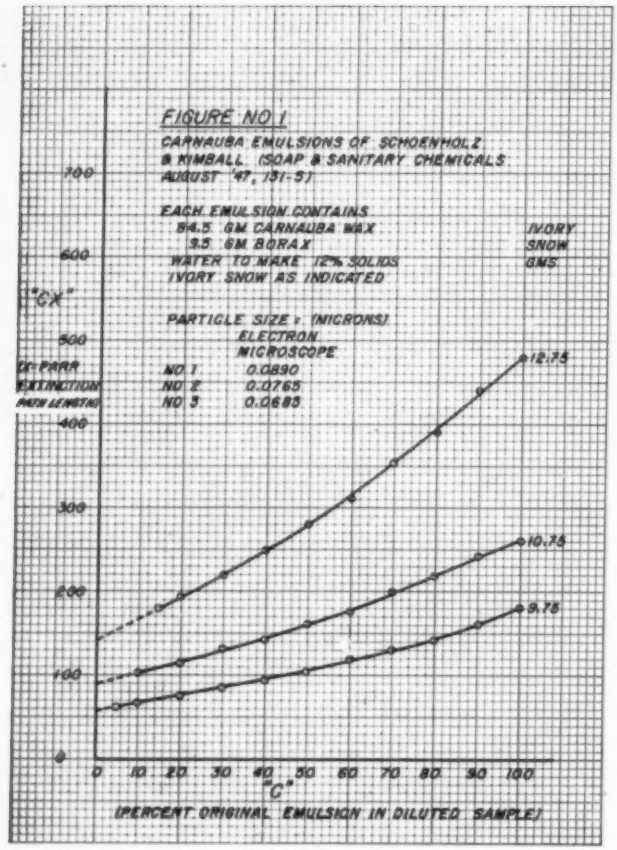


FIGURE NO 1
CARNAUBA EMULSIONS OF SCHOENHOLZ & KIMBALL (SOAP & SANITARY CHEMICALS AUGUST '47, 131-57)
EACH EMULSION CONTAINS
84.5 GM CARNAUBA WAX
9.5 GM BORAX
WATER TO MAKE 12% SOLIDS
IVORY SNOW AS INDICATED
IVORY SNOW GMS
PARTICLE SIZE : (MICRONS)
ELECTRON MICROSCOPE
NO 1 0.0890
NO 2 0.0765
NO 3 0.0685
"CX"
"C"
(PERCENT ORIGINAL EMULSION IN DILUTED SAMPLE)

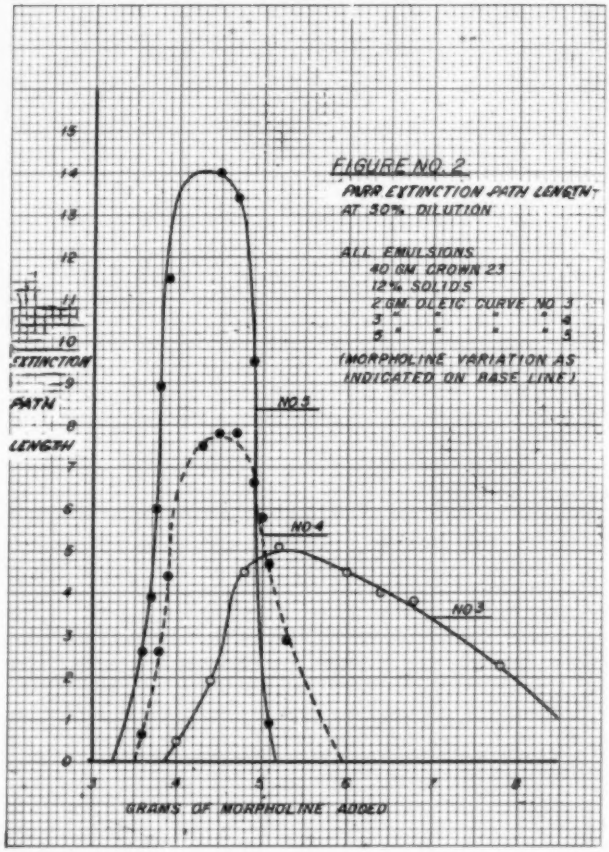


FIGURE NO 2
PARR EXTINCTION PATH LENGTH AT 30% DILUTION
ALL EMULSIONS
40 GM CROWN 23
12% SOLIDS
2 GM OLEIC CURVE NO 3
3 " " " " 4
5 " " " " 5
(MORPHOLINE VARIATION AS INDICATED ON BASE LINE)
EXTINCTION PATH LENGTH
NO 3
NO 4
NO 5
GRAMS OF MORPHOLINE ADDED

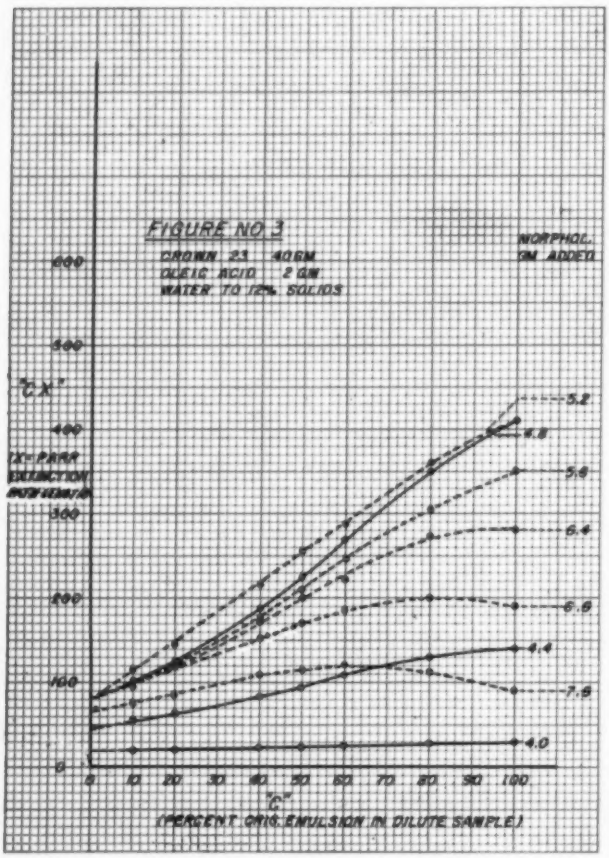


FIGURE NO 3
CROWN 23 40 GM
OLEIC ACID 2 GM
WATER TO 12% SOLIDS
MORPHOL. GM ADDED
"CX"
"C"
(PERCENT ORIG EMULSION IN DILUTE SAMPLE)

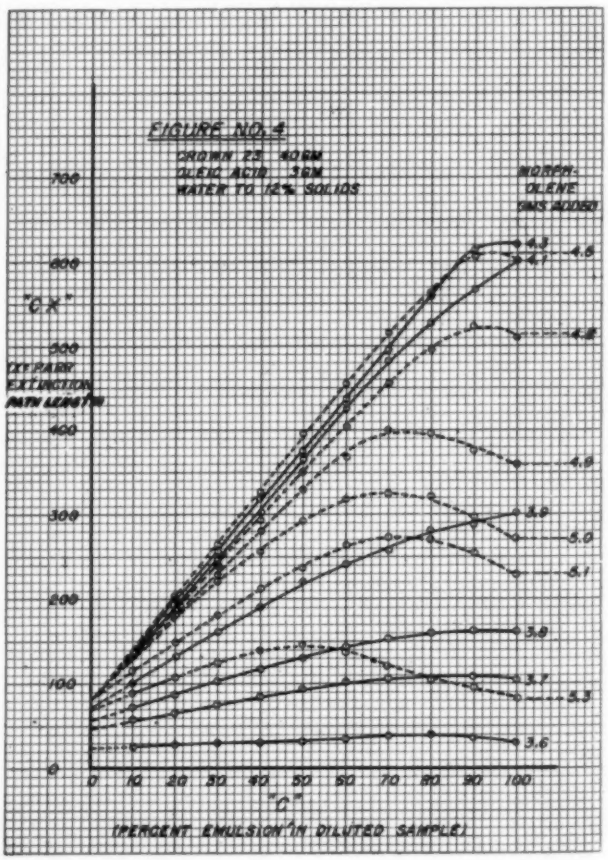


FIGURE NO 4
CROWN 23 40 GM
OLEIC ACID 3 GM
WATER TO 12% SOLIDS
MORPH. OLENE GMS ADDED
"CX"
"C"
(PERCENT EMULSION IN DILUTED SAMPLE)

n is the refractive index of the suspension and n_o is the refractive index of the solvent or dispersing medium.

The refractive index of the suspension is dependent on both n_o and the refractive index of the suspended solid, and in general $(n-n_o)$ for this type of suspension is a linear function of the concentration (C); writing

$$n - n_o = k'C$$

substituting in (3) and lumping constants,

$$H = K' (n_o)^2$$

In using this instrument it has been found that the errors in reading are approximately 1 per cent whereas changes in n_o are much less than 0.1 per cent, so for practical purposes n_o may be regarded as constant and the value H becomes independent of concentration.

Using the value of r from equation (1) in equation (2) and representing collected constants as K, we have:

$$CX = K/M + 2\,KBC \qquad (4)$$

presented in terms of the average diameter (D) as follows:

$$M = s_x\, 1/6\pi\, D^3$$

where s is the density of the particle. Substituting in equation (4) we have,

$$CX = K_1/D^3 + 2\,KBC \qquad (5)$$

which is the desired relation between average particle diameter and extinction path length. A plot of CX values versus concentration will thus have an intercept at C = O, which is a constant, times the reciprocal of the average diameter of the particle cubed. The intercept at C = O, therefore, provides a measure of relative particle size in different emulsions.

By differentiating equation (5) with respect to C,

$$\frac{d(CX)}{dC} = 2\,KB$$

we have the slope of the dilution curve at any point on the curve. It may be noted that the constant K_1 is a general constant for all emulsions, whereas the value of the differential is a specific constant for an individual emulsion, and it includes the value B which is a constant in the osmotic pressure equation to compensate for the deviation of a non ideal solution from the ideal.

The emulsions studied during the present investigation were all prepared to contain 12 per cent by weight of total wax and soap. Each emulsion was then diluted with varying quantities of distilled water, measurements of extinction path length being made after each dilution to yield a series of X values at different C values. Plots of CX vs. C were then constructed from these data.

If an emulsion of known weight average particle size were available, one could evaluate the constant K_1 of Equation (5) and thus convert the visual turbidity measurements into a means for evaluating absolute particle size.

Schoenholtz and Kimball (2) in their paper on measurement of particle size by the electron microscope have given data on average particle size of three emulsions as determined by actual measurements from an electron microphotograph. Figure 1 shows plots of CX versus C values for emulsions prepared according to their formulae. For the purpose of establishing a value for K_1 in equation (5), Table I was prepared from these curves, the values being calculated, where I_v is the intercept at C = O, from the relation derived from Equation (5):

$$K_1/D^3 = I_v$$

It will be noted that values of K_1 so calculated agree reasonably well, having an average deviation from the the average value of less than five per cent. This is somewhat better constancy than could have been anticipated from the reproducibility of extinction path length measurements at higher dilutions.

It should be pointed out that the particle diameters of Schoenholtz and Kimball used in Table I are number averages rather than weight averages and were employed in the absence of the latter. However, from the considerations of light scattering theory and the approximate, at least, fit of these experimental data to the theory, we conclude that visual turbidity measurements are suitable for the determination of relative particle sizes in wax emulsions and are capable of giving approximate values of absolute particle size average in individual emulsions.

A very useful form of plot is shown in Figure 2. This is a plot of the extinction path length of the 50 per cent solution of emulsion versus the amount of the reagent varied. While it is not universally true, most of the CX versus C curves are straight lines from 50 per cent dilution downward. The minimum particle size as indicated by the dilution curves is always at or near the inflection point on the rising side of the 50 per cent dilution curve. For preliminary exploration of emulsions, this curve indicates the approximate location of the minimum particle size point, the sensitivity of the system to the varying reagent and the approximate minimum particle size which is attainable with a given system.

The system illustrated by Figure 2 indicates that particle size is increased with decreasing oleic acid addition as indicated by the height of the curves, that sensitivity of the system to added morpholine is decreased with decreasing oleic acid and that relatively more morpholine is required for emulsification as the oleic acid is decreased. The main purpose of this plot is preliminary, however, and for more complete information the complete dilution curves should be plotted.

The extinction path lengths

TABLE No. I

Evaluation of K_1 from Turbidity Measurements

No.	*Gm. Soap*	I_v	*S&K Diameter (Microns)*	K_1
1	9.75	58	0.0890	0.0409
2	10.75	90	0.0765	0.0405
3	12.75	142	0.0685	0.0456
				Average 0.0423

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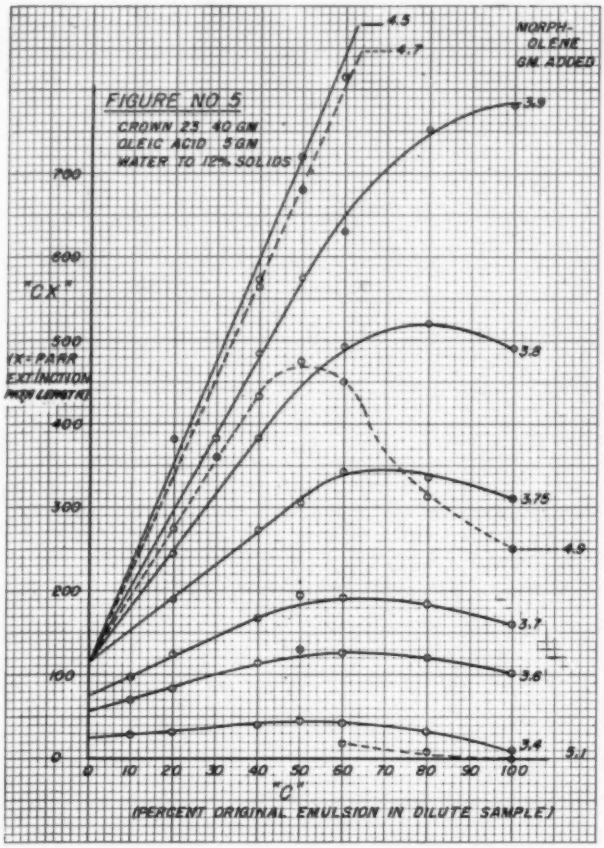
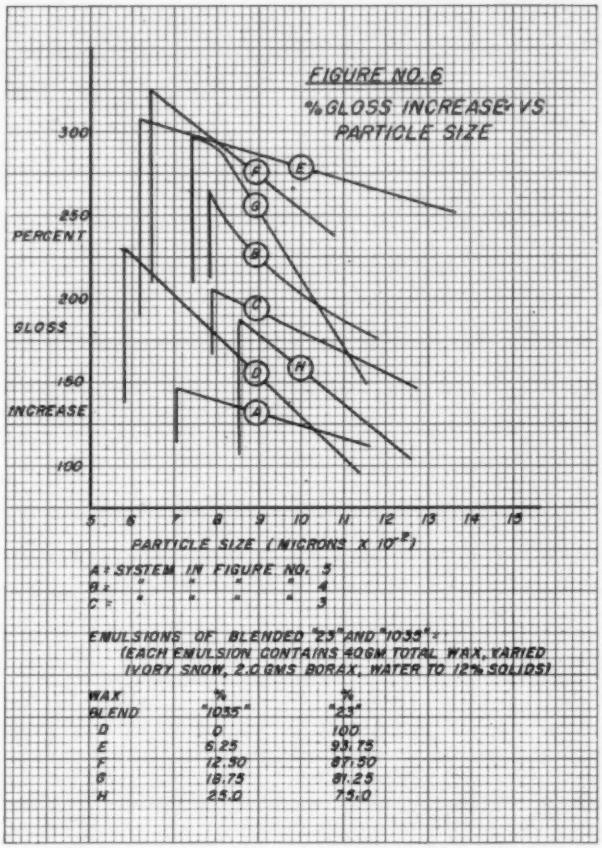




were determined for various dilutions of this same series of emulsions. The resulting data are shown as CX vs. C plots in Figures 3, 4, and 5. These dilution curves indicate that as morpholine addition is increased for a given added amount of oleic acid, the particle size of the finished emulsion decreases to a definite limiting value and that further addition of morpholine past this point has no effect on particle size. This limiting particle size is reached at a morpholine concentration corresponding to that at the point of inflection in the plot of morpholine concentration versus extinction path length of the 50 per cent emulsion, given in Figure 2. It is also to be noted that the slope of the CX versus C curves reaches a maximum at somewhat higher morpholine concentration. As the morpholine concentration is increased above this amount, the slope of the CX versus C curves steadily decreases, but there is no appreciable change in particle size until relatively high concentrations of amine are approached.

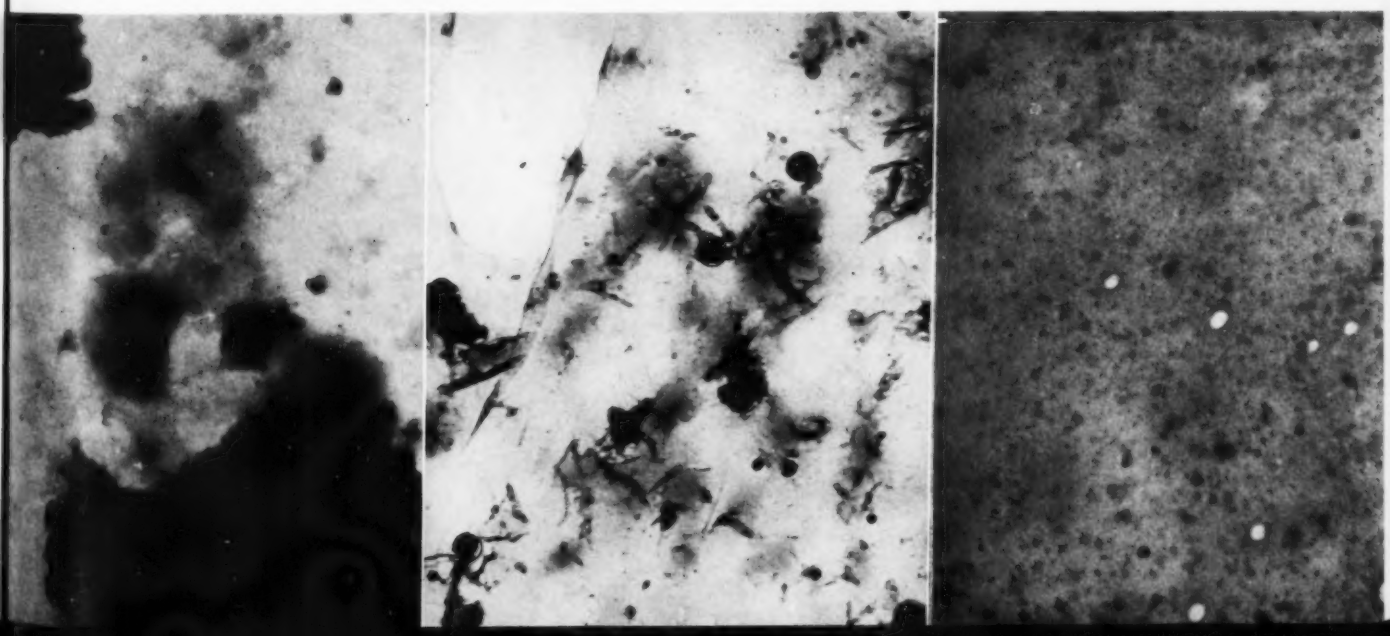
Another interesting point in relation to the dilution curves is that the first changes in slope occur at the concentrated end of the curves, and

(*Turn to Page* 141)

Photograph 1. Emulsion with excess of amine.

Photograph 2. Emulsion containing less than optimum quantity of amine.

Photograph 3. Emulsion with optimum quantity of amine.



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Designing An Aerosol Deodorant*

By Lloyd Beck†
Yale University
and H. R. Shepherd
Connecticut Chemical
Research Corp.

IN considering the design of a household deodorant it was found that the liquified gas aerosol method showed the greatest promise since the particles produced offered exceptionally large surface adsorptive area. The aerosol method provides also for uniform and immediate distribution of deodorizing particles into the space being treated. Further, the aerosol method prevents the selective evaporation of components.

I.—Theoretical Considerations

THEORETICAL considerations in the design of a household deodorant must encompass some of the practical findings of the past, as well as possible methods of odor control. It would seem that physical, chemical and physiological methods could all be incorporated in a particular household deodorant.

The deodorant, first of all, should have a rapid action. At the same time, there should be a selective removal of malodorants. There should be no removal of "danger" smells, such as illuminating gas, nor should the deodorant mask pleasant odors.

The deodorant should provide a pleasant odor which could be introduced at will. This would indicate that physical properties would be much more advantageous to employ than chemical properties since reactivities usually involve the introduction of a highly irritating odorous substance. The basic property of common household odors—solubility in water—leads to the suggestion that such odors be removed by an aero-colloid which would adsorb water soluble compounds differentially from the adsorption of lipoid soluble compounds. In addition, it should have the property also of removing suspended aerosols. These offer large fat adsorption surfaces which may be highly malodorous, as in the case of stale tobacco smoke, fats or dust. Solid aerosols are ordinarily the dust particles—pieces of lint and silica in the air. The problem is to wet them and make them heavier so that they are dragged down. A second problem is the electrostatic attraction of fatty aerosols, and the removal of droplets of oil such as arise in smoke.

From the foregoing considerations it would appear that the substance included in the aerosol deodorant should adsorb water soluble molecules from the solution in the air and should have a charge such as to attract electrostatically fatty aerosols. Besides, the deodorant should be able to wet solid aerosols in such a way as to make them heavy and drag them from the air. Such a deodorant would work effectively not only on transient water soluble odors, but it would also remove smoke and dust from the air.

II.—Practical Considerations

IN addition to theoretical considerations in design, there are practical aspects. Having satisfactorily adjusted these, general experimental problems arise for which special apparatus has to be devised.

Finally, in the development of a deodorant there must be consumer testing in order to validate the laboratory tests and, lastly, there must be the validation of sales.

Certain practical considerations in design are most important because they are affected by such things as cost and availability of materials. The practical considerations can be broken down into three categories:

a) Commercially available materials.
b) The product's use.
c) Production problems.

The use of commercially available materials is most important. While one might find a very important product available in laboratory quantities only, unless it is readily available and reasonably priced, it is useless from a practical standpoint. Hence, one is limited to the set of solvents and chemicals which appear in the common indices.

Consumer use is the second consideration. It involves some *a priori* reasoning in product design. Consumer use relates to type of container, dispensing, etc. Also involved is simplicity, particularly in the method of dispensing which should be obvious with a minimum of instructions. Simplicity applies also to the type and variety of materials in a product. As more and more materials go into a product, the greater are the number of possibilities for unpredicted reactions. As the number of components in a product increases, production and mixing difficulties increase in almost geometric proportion.

Then, too, the results of the past experience of other people in the deodorant field should be remembered. The deodorant design must satisfy the results of past market surveys. It has been found that even though certain types of deodorants have been effective, they have not sold well, indicating a deficiency that must be made up for in a new product.

Instructions which go on the product label must really be designed to fit the consumer and should not attempt to train the consumer out of well-established habits. Perhaps this could best be stated as having the consumer write his own instructions, or, putting it another way, the product should be designed to fit the consumer and not the consumer to the product. In this way much less resistance is encountered in the use of a product.

The product should require non-toxic materials. Most toxic materials have unpleasant odors and toxicity can range from mild irritation upwards.

Production Considerations

LASTLY, and probably one of the most important practical considerations in design, is production. Here, two things are important—one, there must be a relative ease of laboratory procedures. Involving a large number of stages of the product in the laboratory means essentially separate operations on a production line. The second aspect of production considerations concerns the compatability of the formula with standard production sequences.

With the foregoing in mind, an aerosol method of household odor control seems most promising providing one can incorporate components which would cover the physical, chemical, and psychophysiological methods of odor control. One can incorporate methods of absorption, adsorption and cooling, as well as ways to hasten them. He can bring in also electrostatic

*Before the 35th Mid-Year Meeting, National Association of Insecticide & Disinfectant Manufacturers, Chicago, June 14.

†Dr. Beck, assistant professor of psychology, is a consultant to Connecticut Chemical Research Corp.

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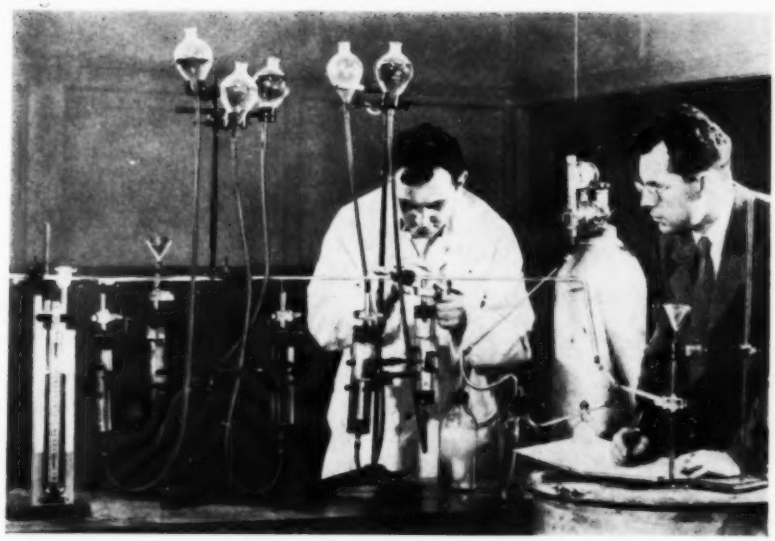


Dr. Beck, at left, using the Bostwick "Odorometer." Mr. Shepherd is at right.

precipitation of aero-colloids by physical methods, particularly if he incorporates certain basic characteristics in the carrier. Chemical methods can be incorporated, but one has to be careful against irritant or toxic action. The physiological methods have advantage only in terms of masking, adaptation, and probability films.

III.—The Laboratory Stage

TO evaluate a household deodorant in the laboratory, one has to have some method of measurement. Odor measurement consists basically in obtaining a number to represent odor intensity. This necessitates, at one level of analysis, a measurement of the concentration of an odorant sufficient for a subject to be able to identify the odor present or, at levels above threshold, a measurement is required in terms of equating the intensity of an unknown with a standard odor concentration. The experimental procedures must measure the following olfactory effects. First, it must measure the effects of masking. In order to do this, one must measure the intensity of one odor as a function of the concentration of a masking odor. This change in threshold of one odor as a function of the concentration of another odor defines masking.

Two. Since the deodorant is to be used in the home, the laboratory procedures must duplicate the home situation in miniature with control of the malodorants both as to type and concentration.

Three. The odor intensity of type malodorants must be measured in order to find the effectiveness of the deodorant.

Four. It must measure the odor intensity of the deodorant itself.

Five. It must measure the odor intensity of type malodorants as a function of the intensity levels of the deodorant.

Six. There must be provision for measuring the temporal span of action of both malodorant and deodorant. That is to say, a deodorant which is effective for only a short period of time would, obviously, be of little use. The deodorant must, in other words, have a time span of action which is measurable.

Seven. The chamber must be able to measure the adsorptive power of carriers. To make this measurement, a malodorant is first sprayed, next the odorless deodorant carrier is introduced. Then the thresholds for the malodorant are determined after periods of adsorption time. This adsorptive power of a deodorant thus measures its ability to remove malodorants from the air and thus satisfies the first condition of odor control.

Eight. Since it is known that atmospheric conditions affect odor intensity, these conditions must be approximated. The influence of relative humidity and temperature on odor intensity suggests that the housewife keep the room temperature above 75 degrees in the winter because she lowers the effective ambient odor level of her home.

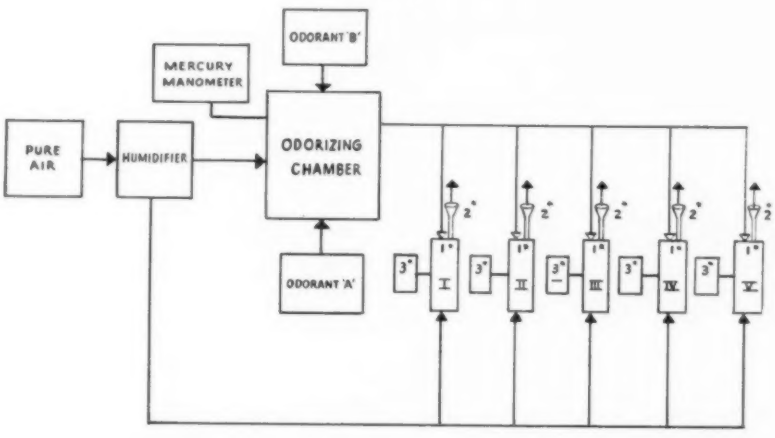
It has been known for some time that as the temperature of a gas at the nostrils increases, the concentration required for detecting the odor increases. The major atmospheric condition which affects odor intensity is related to the moisture content of the air. It is known, for instance, that dogs can track better on a humid day and, furthermore, that the frequency of complaints of gas leaks increases with humidity. Gas companies have a greater frequency of complaint during the spring, summer, and fall months than they do during the winter. Furthermore, gas leaks are considerably more noticeable in damp basements than they are in dry ones. As a consequence, the apparatus designed for measuring odor intensities must be able to control temperature as well as the relative humidity of the air the subject sniffs when the odorous intensity of a compound is being determined.

Nine. The specifications can be stated as far as the test sniff itself is concerned. The apparatus must deliver a known volume of sniffable, odorized air at a constant pressure, temperature, and relative humidity. When this is done, the primary condition for reproducible laboratory results is satisfied and one other condition is left for measuring odor.

Ten. The second condition for giving reproducible results requires using trained subjects. It takes approximately two weeks to train a subject to sniff. Before that time, one gets spurious results and often this accounts for some of the discrepancies between data obtained under the somewhat haphazard conditions of ordinary odor measurement.

These variables were brought under experimental control in the design of, and the procedures for using, the Bostwick Odorometer. (The Odorometer consists of the sequence illustrated in Figure 1.) The source of pure air was bubbled through humidity controlling solutions to

FIGURE 1



*1 - TEST CHAMBERS I-V
2 - OLFACTORY SAMPLING FUNNELS
3 - WATER + HUMIDIFYING SALT MANOMETER

a large mixing chamber until a certain pressure was built up in that chamber. This large chamber consisted of a steel drum, the walls of which had been coated appropriately to reduce contamination. Even here there are difficulties because thorough scrubbing is required when the odorant is changed and ultra-violet light had to be used to drive off adsorbed odors as the chamber was being aereated. This chamber duplicates a room in miniature. At the top of the chamber are holders for two Continental cans, each of which contains "Freon" as a propellent and diluent for the known amounts of the odorants they contained. It is possible, by knowing the spray rate of these cans and the time they are sprayed, to produce an approximate odor concentration in the chamber. It is a disadvantage to know exactly the concentration because such knowledge introduces anticipatory errors on the part of the trained subjects. When an experimental run is finished, the cans can be weighed and the amount of odor released in the odorizing chamber can be determined exactly. From the odorizing chamber a tube leads off to the test chambers. These consist of a set of five tubes containing humidity controlling solutions. One can fill these tubes in varying proportions of pure humidified air and an odorized air. The tubes thus serve as a dilution method of obtaining varying samples of the malodorant in the chamber. These test samples are pulses of controlled volume, pressure and duration. Each test pulse, falling off exponentially, gives the test sniff in a rapid portion of time and thus one gets an almost constant duration pulse of known volume. Some training is required for the subjects in order to have them time their sniff with the release of the pulse. But the method controls the difficulties and possible criticisms of the blast injection technique which Wenzel has pointed out.

The relative threshold can be obtained then in terms of these varying proportioned volume dilutions. Two procedures are possible: An individual subject can go from concentration to concentration, or five subjects can be run at a time on varying concentrations. The subject knows the odor he is looking for and is asked whether or not he smells that particular odor. As a check against his own subjective guessing, and suggestibility, one of the chambers may be filled with pure air, in which case, if he responds, we have a method of measuring his guessing and can correct the raw data much in the way that true-false tests are corrected, by subtracting "wrongs" from "rights" before determining the percentage grade.

After the test runs were made to determine an odor threshold, the cans were removed from the chamber and weighed. Their weight before and after, and the percentage of concentration introduced into the can, give us an exact measure of the concentration of the deodorant in parts per million because the volume of the chamber is known.

One of the most interesting set of results we obtained on the chamber is one that substantiates, in part, the common knowledge of man, but under controlled laboratory conditions. These results concern the relationship between dew point and odor threshold. The dew point was measured and determined in conjunction with the odor intensity measures. It was found over the reproducible range that the odor threshold decreased as the dew point increased within the limits of 50°F to 70°F, the range of useful accuracy of our instrument. (Figure 2 presents these results.) This finding has a very important practical consideration because it means that odor problems are going to be more difficult in the humid East and Northwest and South. The Odorometer can be easily adapted to solve a large number of problems merely by changing the size and shape of the incoming chamber.

Some secondary results indicated that masking, at most, could raise the threshold by approximately ten times and still keep within the bonds of ordinary odor intensities without using some kind of a "brute force" odor such as one might find in a paint shop. It might also be pointed out that results obtained with the Odorometer indicate that kerosene is not generally suitable as a carrier because the odor of the kerosene itself has to be masked.

One of the most interesting aspects of

FIGURE 2

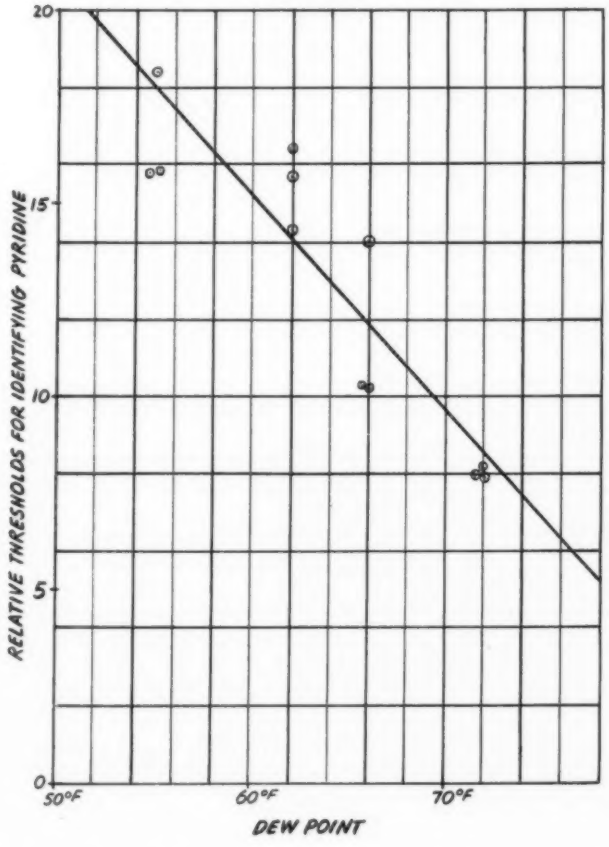
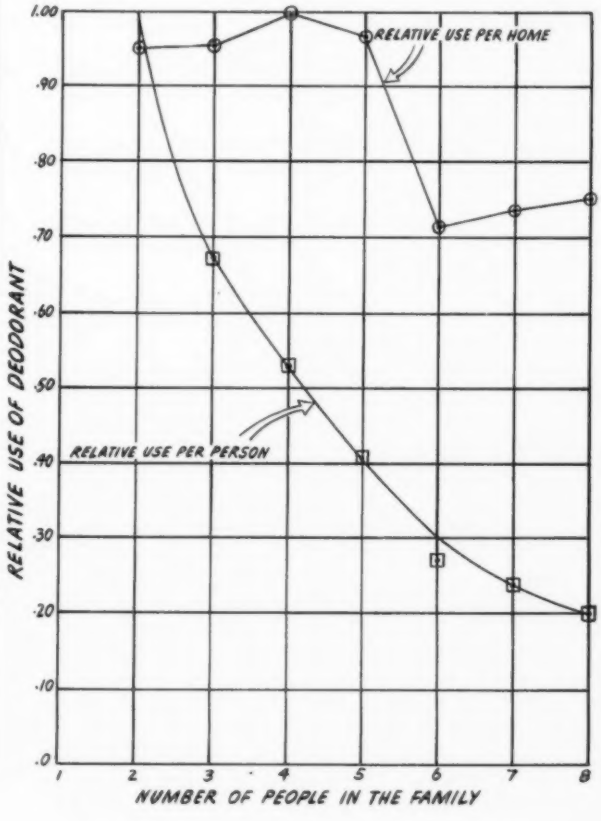


FIGURE 3



the research concerned the choice of the carrier itself. Several possibilities were explored. For adsorption to be most effective, the carrier should have wetting properties in order to adsorb and hold the common water soluble malodorants.

Secondly, in order to remove solid colloids from the air, such as dust particles, the carrier itself must be able to wet these colloids to make them heavier.

Thirdly, in order to eliminate smoke from the air, the carrier, in aerosol form, must possess a negative electrical charge because of the positive charge present on oil particles of smoke in the air, particularly tobacco smoke . . . a charge which is picked up from the approximately 100 volts per meter which exist in the ordinary air situation. In order to do this, an asymmetric molecule is required which is polar. Secondly, it must have properties of adsorbing and absorbing water soluble malodorants and must also be commercially available. An exploration of several possibilities indicated that only a few of a very large class of compounds would do the job. The compound had to have a fixed dipole-moment as well as having water solubility. When this is done, one can demonstrate that the charges on the particles are negative and that they discharge an electroscope and, secondly, it must have a large di-electric constant in order to be able to continue its action over a period of time without being discharged itself. Such a compound was found and is known under the name of "Valium."

Having achieved all that could be done outside of actual marketing, which is the final test, an experimental marketing program was undertaken in localized territories with a view to determining consumer acceptance, through the conventional trade channels. The findings of this test, which led to the ultimate design of the product and the reception received in these limited marketing tests, did substantiate and validate our findings.

It should be pointed out that laboratory data, although predictive and amenable to production considerations, are valueless unless the product is submitted for consumer evaluation. Even with the laboratory experimentation we did not know the particular odor type to incorporate into the deodorant. We knew that one had to be included because it seems to satisfy an important consumer need in that it lets the person manipulate his own odor environment. Perhaps it is the failure to meet this need that is responsible for the lack of consumer acceptance of some deodorants, even though they have been effective.

Accordingly, a consumer research project was organized primarily to select the most suitable of a set of seven odors which had been pre-selected in conjunction with perfume chemists, and in terms of our own designs. Of the homes selected, we obtained 85 per cent co-operation. The following information was gathered: Type of odor preferred; number of people who previously had bought a household deodorant; number of repeat buyers; and number of people who had not rebought and their reasons; the relative use frequency of deodorants in homes, room by room. We desired to know the use frequency as a function of family size—*a priori*, one might expect that the more people living in a house, the bigger the odor problem that might arise. We wanted to know the relationship between income level and the use of a deodorant.

The use of the deodorants can be ascertained at three levels of measurement—one, a verbal preference; two, in terms of spray frequency preferences; and, lastly, the actual behavioral preference. This was evaluated by determining the amount used during the test period. From these data the relationships between verbal preference, spray frequency preference, and actual use preference can be determined. In the end, the actual use preference is the most consistent measure because people very frequently say and do things, without knowing why.

With these points in mind, several questionnaires were prepared. The first questionnaire was given, by trained interviewers, to the people on the first day they received their test deodorants. Since approximately half of the homes were divided into $7500 homes and to $8800 homes, an economic breakdown could be made in terms of where they lived. A second measure of economic level is having a telephone. A third indication of economic level is given when, if in response to the question, "Why have you ever bought a household deodorant?", the answer is, "Heard they're good, but not worth the price.", we have a hidden economic question. People are reluctant to say, "Can't afford it!", a point indicated in previous questionnaire studies.

Market potential is revealed in the answer to, "Have you ever bought a household deodorant?". We found that 75 per cent of the families had bought a household deodorant. Another question, "Have you bought it more than once?", yields the following information: It gives an estimate of the entrenched market and also gives a measure of market resistance. If deodorants were not repurchased, we found out also why they were not and can direct advertising on the basis of their answers. Information was gathered which gave an excellent estimate of the present market.

The seven odor types were set up thus in replications of twenty-one pairs around the homes, with each family having two cans to compare and where one family might have Odorant "A" in a blue can and Odorant "B" in a pink can, another family might have this same pair with the colors reversed. The balanced design avoids the effects of color preferences. One woman, when she saw one of the research assistants coming with a pink and a blue can, said, "Just give me that pink can—I just love that color!" I'm going to buy it right away!".

When we came around a week later to pick up these cans, we asked even more questions. We wanted to find out which odor they liked best . . . if they liked either or didn't like them at all. If they disliked them, we wanted to find out why they disliked them, and then, if the people had used a deodorant previously, we wanted to get the comparison with the ones we were having them test and those they had used previously.

Of course, this is not particularly an experiment, but one counts on the presence of the materials available to give a sufficiently good comparison. Of these, only one product appeared in sufficient quantities to give results significantly unexplainable in terms of sampling fluctuations, although the trends were all in the direction of the experimental product. In fact, 97 per cent of the people preferred the aerosol method to any other method.

Three of the results of the study we can present are:

1) 75 per cent of the homes had purchased a deodorant at one time.

2) 97 per cent of the people preferred an aerosol deodorant.

3) Figure 3 presents the relative use per home and the relative use per person in the home as functions of family size. The results indicate that, although there is some evidence for a declining use per person, the relative constancy of the use per home shows that the home is the unit in that the fundamental activities of housekeeping are essentially the same, regardless of family size.

In summary, an aerosol deodorant was tentatively designed on the basis of an analysis of odor problems in the home and the design was modified on the basis of theoretical, practical, and experimental considerations. Its design was finalized on the basis of actual use tests in a representative sample of homes. Validation of all the above was achieved in a test through actual sales in limited territories.

WAX EXAMINATION

(*From Page* 133)

that the slope of the more dilute portion of the curve is not affected until a much greater excess of morpholine is present. Photograph 1 is an electron microphotograph of an emulsion with an excess of amine present over that required for minimum particle size formation. It seems to indicate that past the point of maximum slope, agglomerates of wax particles of very small size tend to form. This would explain the phenomena mentioned above very well in that the larger agglomerates would tend to give a greater average particle size at the higher concentrations but would be broken down or dispersed into the true wax particles as the emulsions are diluted. The gradual movement of this effect to give inordinately low slope values at lower concentrations is believed to be due to the tendency of the increasing morpholine or soap to convert more and more of the particles into agglomerates.

Photograph 2 is that of an emulsion with a deficiency of amine

present, while Photograph 3 is of an emulsion which has just enough amine present for minimum particle size formation. These two photographs clearly show the small individual emulsion particles, many of which are anisotropic or crystalline in appearance.

Huggins (4) in a theoretical study of the thermodynamic properties of high polymer solutions or dispersions, was led to the conclusion that those systems which would give a steep slope to the CX vs. C curve contain highly peptized, discrete particles, whereas those with small or negative slope contain particles showing more or less interaction. Those systems having slopes of the CX versus C curve below a critical value determined by the molal volumes of solvent and dispersed phase, will undergo gelation or separation of phases. Oster (3) is of the opinion that a large slope value is indicative of elongated, highly peptized particles, while low slope values indicate spherical particles which interact with each other to give some structure to the system. These conclusions, as applied to the present wax dispersion systems, are fairly well borne out by the electron microphotographs referred to above.

The fact that the original equation for the non-ideal solution is really that of a straight line indicates that the pronounced curving of the high concentration ends of the dilution curves as their slope decreases is caused by a departure from the nature of a solution, perhaps with the introduction of a third phase of excess emulsifying agent surrounding the wax particles. Theoretically this would indicate that there is increasing instability as the dilution curves depart from straight line functions. Actually 30 day 125°F. stability tests on these emulsions indicated instability only on the extreme low ends of the 50 per cent dilution plots, or in the range of very low slope values of the dilution curves as would be predicted by Huggins' theory. In all cases the stability at maximum gloss was high so that obtaining maximum gloss was the governing factor of the two effects studied.

Figure 6 shows the relationship of gloss to particle size of emulsion as measured by the method described in this paper. Gloss tests were made on freshly washed, new, green battleship linoleum with the Gardiner Portable 60° Glossmeter. Prior to gloss measurements an addition of 10 per cent of a 12 per cent solution of shellac in ammonia water was added to each cooled emulsion. Care was taken to select linoleum strips of equal gloss "blank" values. Only one film was applied to the linoleum in all tests.

Figure 6 indicates that in all emulsions of oxidized wax studied, the maximum gloss point is that at which minimum particle size for the system is first obtained, and that further addition of emulsifying agent past this point decreases the gloss of the applied film. For most of the emulsions studied gloss seems to be a linear function of particle size for each emulsion up to the point of minimum particle size. There is no absolute correlation of gloss to particle size generally although particles in the range of 0.06 to 0.07 microns in diameter appear to be uniformly productive of good gloss.

Curves D, E, F, G, and H of Figure 6 indicate that there are other factors involved in good gloss characteristics, aside from the ability of a wax to form proper particle size. These curves indicate that increase in gloss may be obtained for a given particle size by the blending of hard inert ingredients into the oxidized wax prior to emulsification.

In using the turbidimeter on wax emulsions it should be remembered that K_1 is dependent on the individual operator since it is a function of the operator's visual acuity (I). To check the degree of reproducibility of readings and of the emulsion formation technique as well, three separate operators at two month intervals prepared the emulsions shown in Figure 7, each reading his own emulsions at the 50 per cent dilution extinction point. The data indicate that the technique and readings of the various operators have sufficient reproducibility for our purpose.

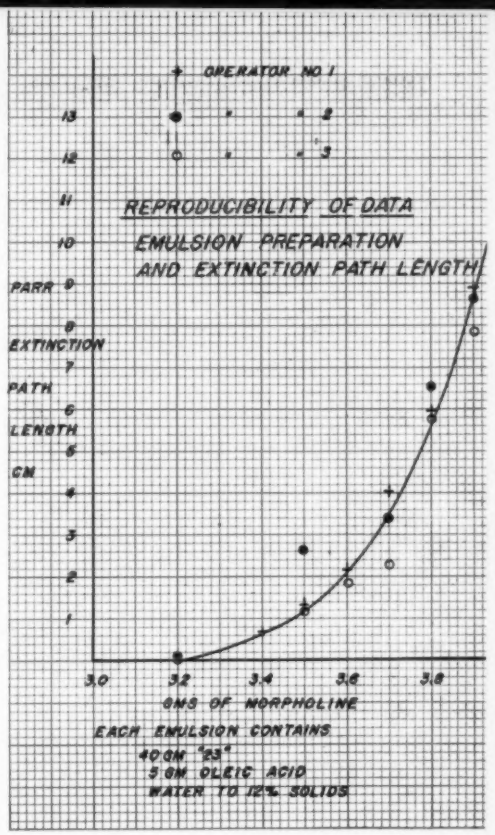


Figure 7

Summary:

THE simple visual turbidimeter may be adapted to the measurement of particle size in a study of dry bright polishes. It may also be used as a basis of correlation of such emulsion characteristics as optimum gloss and stability or as an instrument of control on actual production of water suspension polishes.

Maximum gloss characteristic for oxidized petroleum wax emulsions is obtained at the minimum particle size obtainable with a given wax. Addition of excess emulsifying agent above this point decreases gloss and the use of very excessive amounts can harm stability of the finished emulsion.

Optimum particle size for best gloss seems to lie in the range of 0.06 to 0.075 microns average particle diameter.

Gloss of oxidized wax polishes may be improved by the addition of hard, glossy inert materials so long as the ability of the oxidized wax to form optimum particle size is not impaired. Gloss increases in excess of 300 per cent may be obtained by this method.

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did succeed in recovering 50 per cent of the detergent solution used in shampooing. This corresponds well with the results indicated above.

The Effect of Concentration

FROM other experiments not detailed in this report, it was found that within the limits of concentrations tested greater detergency is obtained by using high concentrations of soap than by sharply increasing the concentration of synthetics. In field work, soap users frequently increase the concentration of solutions to meet severe conditions. It is our feeling that equivalent results will not be obtained by increasing concentrations of synthetics beyond their optimum level. However, without an answer as to how to increase detergency for high soil loads, or how to cope with the many variables encountered in field work, an investigation of this sort has academic value principally to an operator. Therefore, an attempt was made to analyze the factors under the control of the operator, such as brushing time, concentration and volume of detergent (as related variables), to determine whether some indication of proper operating procedures could be established. The data covering this work are reported in Table III.

The most significant fact from this work is that an increase of detergency of 74 per cent is achieved by decreasing the speed of detergent feed while increasing the brushing time. Also of great importance is the fact that very high detergency levels were apparent when the carpet is cleaned once, allowed to dry over-night, and recleaned the following day. It is believed that the development of techniques along these lines will significantly increase the efficiency of on-location shampooing.

Effect of Hard Water on Detergency

A STUDY of the effect of hard water on shampoos showed that soap detergency drops sharply in the presence of mineral impurities even though the concentration of soap is in the range used by commercial laundries for washing cotton. On the other hand, the cleaning action of synthetic shampoos was not materially affected by the hard water.

Effect of Shampoos on Carpet Serviceability

AS INDICATED in Table I of this review, 70 per cent or more of the detergent solution remains in the carpet after vacuuming. On drying, the detergent residues can be expected to be concentrated or dried into the pile and backing. Inasmuch as location cleaned carpets store up detergent residues, the selection of shampoo must be carefully considered since certain residues may have an effect on the serviceability of the carpet. We can expect that the major serviceability factors which will be affected by these residues will be wearability, color value, and resoiling resistance. Since wool is very susceptible to alkali damage and because a high pH or high alkaline buffer capacity could be expected to have some effect on wear-life, routine determinations of pH and alkali reserve were made on all shampoos. Two soap products had a pH above 10, whereas the remainder of all detergents analyzed were below pH 10. Significantly high alkaline reserve was found in only two products, one containing ammonium hydroxide and the other soda ash. In an attempt to determine the possible long-term effect of various shampoos on carpet wool, the following test was performed. A standard carpet wool yarn was impregnated to 30 per cent pickup with each carpet shampoo at its use concentration. The yarn was then sealed in tubes and stored for 3 weeks at 60° C. The temperature of 60° C. was selected as the maximum to be used, as it has been shown that significant changes in the characteristics of wool can take place above 60° C. by distilled water alone.[4] Carpet shampoos containing ammonia or soda ash were found to cause significant losses in yarn tensile strength during this accelerated test. Some of the other shampoos, however, known to contain common builders, did not affect tensile strength any more than distilled water. As a check on this data it was decided to impregnate yarn with only builders and expose them as above. The results are shown in Table IV. Though this data cannot be considered conclusive in ruling out losses of wear resistance of wool pile carpeting, it is considered indicative of the type of damage that might occur from the use of certain alkaline materials.

As part of this general project, an inter-laboratory study amongst members of the technical committee of the Carpet Institute, Inc. compared the wear resistance of carpet samples cleaned for various numbers of times with soap and with synthetic detergents, and then analyzed the wear resistance of the carpet by testing on the National Bureau of Standards' carpet-wear tester. The rate of wear was calculated on the basis of the wear criteria (established for measuring wear resistance of pile floor coverings) after 4400 revolutions of the National Bureau of Standards' tester.[5] The results of part of this work indicate that significantly greater loss of wear life can be occasioned by the use of soap products.

An attempt was also made in this project to determine the relationship of detergent products to fading, bleeding, and other color losses in carpeting. However, since many carpet samples were found which showed very low fastness to light without the addition of shampoos, and carpet colors were observed which showed excessive bleeding and color running in

TABLE IV
Effect of Builders on Yarn Breaking Strength

Compound	pH	% Loss in Yarn Breaking Strength
Borax 1%	9.1	2
Soda Ash 1%	11.0	57
Sodium Bicarbonate 1%	8.1	0
Tetrapotassium Pyrophosphate 1%	9.9	0
Sodium Tetraphosphate 1%	7.9	0
Sodium Sulphate 1%	6.9	0

distilled water, no conclusions were drawn as to any significant safety factor that could be established except the practice of spot testing carpets before cleaning.

As substantial amounts of detergent residues are built up in location cleaned carpets, particularly if cleaning is repeated periodically on the same carpet, it is obvious that the physical nature of the detergent can alter radically the rate at which a carpet collects soil. A wet or sticky pile will attract and hold a certain amount of soil so that no amount of vacuuming or brushing will remove it. Field tests indicated that there were significant differences in the resoiling rate of carpets when cleaned with different types of synthetic detergents and soap. This factor is related not only to the detergent used, but also the type of carpet. The majority of carpets are treated with acid washes during dyeing. This leaves the pH of most carpet yarn low enough to cause significant hydrolysis of soap products and the liberation of free fatty acids in the pile yarn. It has also been reported that acid carpets treated with soap products have marked increased resoiling rates. This is true even in cases where the soap normally would not materially increase the resoiling rate of an alkaline carpet. A laboratory procedure was devised to study the effect of detergent residues on the soiling rate of carpets and it showed good correlation with field tests. This procedure consisted basically of spraying 6" x 6" samples of standard carpet with shampoo solutions at three times the use concentrations to a 25 gram pick-up. After air-drying, the carpets are conditioned at 90 per cent relative humidity, marked with natural charcoal sticks, vacuumed, reconditioned at 60 per cent relative humidity and re-vacuumed. Reflectance readings are taken on the carpet after the original drying, the first soiling, and the vacuuming at high and low humidities. From these data the percent soil retention is calculated.

TABLE V
Effect of the Detergent on Soil Retention

Detergent	Soil Retention*
Anionic A	30%
Anionic B	90%
Anionic C	13%
Anionic D (Built)	20%
Non-Ionic	70%
Cationic	90%

* These percentages are based upon reflectance readings.

Table V indicates the wide variance of soil retention possible by using different synthetic detergents.

Acknowledgments

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The direct assistance of the members of the technical committee, who attended innumerable conferences to guide the work and contribute data and advice, was of inestimable value. Particular thanks goes to Messrs. Ashcroft, Leonard, Swanson, Gross and Smith for their great personal contributions.

Our thanks to the manufacturers of detergent products, who gave not only materials and equipment for this study, but also their practical knowledge of cleaning techniques and problems.

The assistance of the Floor Covering Shop, Inc. Stamford, Connecticut, who made available their plant and equipment for field studies, is gratefully acknowledged.

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MacKinnon NYQ V.P.

Barclay E. MacKinnon, assistant secretary and assistant treasurer of New York Quinine & Chemical Works, Inc., Brooklyn, was recently elected vice-president.

FATTY ACIDS

(*From Page 98*)

fiable content has been investigated in a preliminary manner, and experiments indicate that natural unsaponifiable matter does in part determine viscosity.

Figure 8 shows the results of work using the potash soap of a low titer oleic acid. These data were obtained by extracting the unsaponifiable matter from the oleic acid and incorporating it in predetermined amounts in portions of the relatively unsaponifiable-free acid. Soaps were prepared and adjusted to several different real soap concentrations and the Stormer viscosity at 25°C. determined. By plotting real soap concentration against Stormer viscosity, the soap concentration corresponding to a viscosity of 4.0 was obtained, and these results are presented in Figure 8. As the per cent unsaponifiable increases, the per cent real soap also increases without viscosity change. Stated differently, soap solubility rises with increased unsaponifiable content. Similar results were obtained using the potash soap of a liquid vegetable fatty acid, as shown in figure 9.

Other types of unsaponifiable material have a similar solubilizing effect (such as alcohol, glycerine and the glycols).

An indication of the solubilizing effect of oxidized fatty acid soap

FIGURE 8
Effect of Unsaponifiable Content on Soap Viscosity

Soap: Potash Soap of a Low Titer Oleic Acid

Oleic Acid Characteristics		Percent Unsaponifiable	Percent Real Soap[1] Stormer Viscosity of 4.0 (25°C.)
Titer	4.0°C.	0.08	17.6
Iodine Value	92.3	0.75	17.6
Sap. Value	201	1.00	18.4
Unsaponifiable	0.75%	2.00	18.6
		3.00	20.0

[1] Corrected for percent unsaponifiable.

FIGURE 9
Effect of Unsaponifiable Content on Soap Viscosity

Soap: Potash Soap of a Liquid Vegetable Fatty Acid

Fatty Acid Characteristics		Percent Unsaponifiable	Percent Real Soap[1] at Stormer Viscosity of 4.0 (25.C.)
Titer	3.3°C.	0.20	18.4
Iodine Value	136.6	0.92	18.9
Unsaponifiable	0.92%	3.00	20.0

Oxidized Fatty Acid Soaps

Percent Real Soap	Stormer Viscosity (20°C.)
19	1.2
20	1.3
23	1.4
26.1	1.7

[1] Corrected for percent unsaponifiable.

is also shown in Figure 9. Before saponification the fatty acid was air-blown for 55 hours at 50°C., and even a 26 per cent soap has a very low viscosity. Oxidation presumably introduces hydroxyl and other oxygenated polar groups which enhance solubility more than the double bond. The fact that soaps of ricinoleic acid, or 12-hydroxy oleic, are more soluble than those of oleic has already been mentioned.

Because there is such a multiplicity of factors influencing soap properties, the manufacture of soaps from fatty acids and natural fats and oils is a constantly challenging business. Consequently, one of the chief objectives of the fatty acid industry is to produce purer, more uniform raw materials that will eliminate some of the variables presently encountered in soapmaking. An example of a successful effort in this direction was the recent announcement of a purified oleic acid from which nearly all the polyunsaturated fatty acids have been removed. This purified oleic acid possesses unique stability and a far better color and odor than any previously available monounsaturated acid. Its stability is illustrated by the fact that triethanolamine soaps prepared from this acid darken very slowly compared to similar soaps compounded from regular oleic acid. Many other examples could be mentioned, such as the removal of rosin acids from tall oil, and the separation of coconut fatty acids into components of 90 per cent purity. Developments such as these some day may enable users of fatty acids to tailor-make soaps to meet highly precise requirements. Certainly every quality improvement that is made brings us closer to that ideal situation.

ANIMAL REPELLENTS

(*From Page* 127)

certain copper compounds. It is stated that commercial dry lime-sulfur mixture has been used successfully to protect stored grains. Strong cayenne pepper, placed on the floor along the walls of a room or in burrows, has also been found to repel rats. It is remarked that repellents or deterrents often may be used to advantage for preventing re-occupation of old burrows and other rat habitations after a successful campaign of rat destruction.

In the field work done by Mills and Munch (14) it was found that the best nonodorous deterrents were copperas, lime, lye, sodium fluoride, powdered sulfur and cayenne pepper. Recently in a report to the Chicago section of the American Chemical Society, Hampel (17) stated that sodium fluosilicate may prove highly effective in keeping rodents out of paperboard shipping cartons. His studies showed that rats will not touch food containing this compound, which suggested its possibilities as a rodent repellent.

Naphthalene, which is rated highly as a repellent for rats is also effective against mice.(18) It has been suggested,(8) for example, that in unused homes, a liberal application of naphthalene flakes, scattered over pillows, mattresses and upholstered furniture will help repel mice. The compound is also useful for driving squirrels away from unwelcome places and for repelling moles that ruin lawns and do other damage (19). In one bulletin (20), it is noted that lye, paradichlorobenzene or naphthalene, introduced into the runways at the rate of a teaspoonful every 10 or 15 feet, are sometimes helpful in repelling moles.

Deer Repellents

DURING the last year or so, a good deal of interest has been evinced in a new type of deer repellent (21) which will probably replace such older deterrents as creosote and camphor. In many parts of the country, especially in New England, marauding deer are quite a problem because they injure young fruit trees, field and garden crops and decorative shrubbery. Annual damage caused by these animals probably runs well into millions of dollars.

The new deer repellent sold under the name "Good-Rite Z.I.P.," is the result of cooperative research between a state and a private industry, namely the Maine Fish and Game Department and the B. F. Goodrich Chemical Co. The product consists of zinc dimethyl dithio-carbamate-cyclohexylamine complex and a special polyethylene polysulfide. Since the first compound is very unpalatable and the second has a distinctive odor, the compound exerts a two-way repellent action. The compound is safe for use on plants and may be employed as a repellent in small gardens, row crops and in orchards. In addition to its value against deer, there is evidence that the product is also effective for rabbits, mice, straying cattle and other animals.

Bird Repellents

THERE is also growing interest in compounds for repelling birds. Some of the interest centers around means of preventing birds from eating poisoned baits set out for rodents. There is evidence that color can help to solve this problem and save the lives of many birds. It has been found that birds have an aversion to unnatu-

rally colored foods, while rodents pay little or no attention to the color of their foods (22).

However, maintenance men and householders alike are particularly interested in ways of keeping birds, notably pigeons, from defacing buildings, window ledges and walks with their droppings. One simple preparation which has been suggested (2) as a pigeon repellent consists of one per cent of oleoresin capsicum in alcohol. This is sprayed over the ledges and other places where the birds congregate so that the active ingredient comes in contact with their feet and bodies. While the spray is nonpoisonous, it is very irritating so that the pigeons do not return to the treated places.

Also worth noting is Creamer's (19) suggestion for deterring sparrows and other birds when they become too noisy or otherwise make nuisances of themselves. The procedure is simple and consists of hanging a cheesecloth bag full of naphthalene balls as close as possible to the place where the birds gather.

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PYRETHRUM FLOWERS

(*From Page* 121)

little change in appearance. After 72 hours the flowers were thoroughly mixed and one portion (lot 20A) spread on a screen to dry slowly. There was some molding before the flowers were dry. This lot contained 0.73 per cent pyrethrins. Another portion (lot 20B) was dried rapidly at 150° C. with a pyrethrin content of 1.00 per cent.

On comparing the effects of the several treatments in this group on the basis of the pyrethrin content of the dried flowers obtained as shown in the table it will be noted that all lots of flowers which continued to mold after they were spread on screens to dry, lost pyrethrins (lots 11, 12A-1, 12B, 12C and 20A). On the other hand, flowers that molded while in boxes or in thick layers but were then dried rapidly or without further molding did not lose pyrethrins or toxicity (lots 9A, 9B, 12A-2 and 20B). Lots 12A-1 and 12C provide evidence that holding the flowers in a five-inch layer for six days does not result in any more damage than holding them under such condition for three days, provided there is no considerable increase in molding during the additional period. The pyrethrin content of that portion of lot 12A that was dried rapidly at 150° C. (12A-2) indicates that there was no loss of pyrethrins up to the time the flowers were removed from the bin. The loss of pyrethrins in the screen dried portion (lot 12A-1) occurred during the period the flowers were slowly drying on the screen.

The treatments used in the third group involve use of the general principle of making silage. If flowers can be stored in a silo-like structure, dried later in small lots as time and facilities permit and without loss of toxicity, such handling may be practical under some circumstances. To test this possibility five pounds of fresh flowers in both years were stored in a sealed glass jar in the dark as described. When removed from the jars they had not greatly changed in appearance but possessed the characteristic odor of corn silage. Only the flowers at the top had molded slightly. Comparison of the pyrethin content of the control and treated lots in 1945 (lots 13 and 14) shows that the insecticidal value of the flowers was not reduced by the treatment.

(*To Be Concluded*)

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TRADE NEWS

Beacon Wax Sues Retailers

Beacon Wax Co., Boston, is suing 40 retailers in New York City charging violation of state fair trade laws in the sale of its floor wax. Total damages sought amount to $2,000,000, according to the company's attorney. Papers were served starting in July and service was completed recently. Under the New York State fair trade laws manufacturers may specify the retail price of their products. The fair trade price of the wax is 59 cents a pint and 98 cents a quart, with comparable reductions for larger quantities. Some retailers have been selling the wax for as little as 40 cents, Beacon's attorney stated. His client is seeking temporary injunctions pending suits for damages. Hearings got under way Aug. 18 in the Supreme Court of Erie County.

Give Away DDT

To promote interest in public health, $59,000 worth of DDT spray was given away by the Sherwin-Williams Co., New York, Aug. 12. Distribution was made to patrons of the fourteen department stores operated by the Goldblatt Bros. organization in Chicago and Joliet, Ill., and in Hammond, Gary and South Bend, Ind. Each person was limited to one quart of the spray.

ACS Meets Sept. 18-23

Insecticides and toxicity will be discussed at the 116th National Meeting of the American Chemical Society, being held Sept. 18 to 23, in Atlantic City, N. J. Approximately 15 papers on various aspects of insecticides will be given at the session on economic poisons in the divisional meeting of Agricultural and Food Chemistry, Wednesday afternoon, Sept. 21.

In Winthrop-Stearns Post

James T. Bollettieri was recently appointed manager of the Manhattan sales division of Winthrop-Stearns, Inc., New York. He succeeds Thomas Bradley, who has resigned. Mr. Bollettieri has been with the firm

JAMES T. BOLLETTIERI

since 1942, when he joined the company as a professional service representative assigned to the division he now heads.

Meinhardt is Liquidated

J. A. Meinhardt & Co., Chicago manufacturers and distributors of sanitary chemicals and janitor supplies, was in process of liquidation last month, under a voluntary agreement between Mr. Meinhardt and a creditors' committee, acting through the liquidation and reorganization service of the Chicago Association of Credit Men, without recourse to bankruptcy action. Public auction of equipment and supplies at the Meinhardt factory for production of para blocks at Wyoming, Ill., was held Aug. 16, and on Aug. 26 assets of the main plant in Chicago were sold by the auctioneer.

Hess & Clark Sell Plant

Sale of its London, Ont., Canada plant was announced recently by Dr. Hess and Clark, Inc., Ashland, O. Reason for the sale of the Canadian plant is the installation of modern packaging machinery and more efficient equipment for handling raw materials at its Ashland plant, according to H. M. Clark, president. The Canadian plant was acquired 17 years ago. A modernization program at the Ashland plant was begun five years ago, Mr. Clark said, but it has been retarded because of difficulty in obtaining certain equipment and slow deliveries. Under the new arrangement, although business for the firm in both the U. S. and Canada has increased, it has been found more economical to supply both countries from the plant in Ashland.

Carroll to Mich. Chem.

Warren Carroll, formerly with Sherwin-Williams Co., New York, recently joined Michigan Chemical Co., St. Louis, Mich., as manager of the company's small package insecticide division. He is making his headquarters at the company's main plant in St. Louis, Mich.

NAIDM Meets Dec. 4-5

Suggestions as to speakers or subjects for the program of the 36th annual meeting of the National Association of Insecticide & Disinfectant Manufacturers, to be held Monday and Tuesday, Dec. 5 and 6, at the Mayflower Hotel, Washington, D. C., have been asked for by Melvin Fuld, chairman of the program committee. According to Mr. Fuld, the program will be arranged as it was for the June meeting in Chicago. There will be five group meetings on aerosols; disinfectants, deodorants and sanitizers; insecticides; soaps, detergents and sanitary products; and floor wax and floor finishes. In addition, there will be two general discussion sessions.

Warwick Handling New Wax

Warwick Wax Co., subsidiary of Sun Chemical Corp., Long Island City, N. Y., recently announced that it had been chosen to distribute a sugar cane wax manufactured jointly by S. C. Johnson & Son Co., Racine, Wis., and Cuban-American Sugar Co., New York. The wax is produced at a newly constructed refinery at Grammercy, La. It has characteristics similar to those of carnauba and ouricury waxes. Warwick is assisting prospective users of sugar cane wax with complete technical service. The company also handles emulsifiable Cardis waxes.

Oregon Fees Explained

An interpretation of the provision on registration fees of the new Oregon economic poison law is contained in a recent letter of J. D. Patterson, chief chemist of the State Department of Agriculture, to the National Association of Insecticide & Disinfectant Manufacturers. The new law, which went into effect July 16, requires a registration fee of $20 per brand for the first three brands (the fee in the old law was $15), with four and not more than 25 registered for a total of $75 and any over 25, $2 a piece. The fee in the old law was $50 for registration of from four to 25 brands, and any over that 50 cents each.

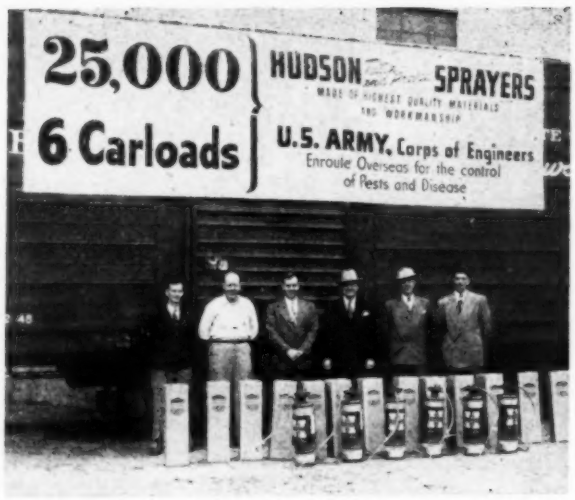
Since registration fees are collected on a calendar year basis there has been some question regarding the interim betwen July 16 and Dec. 31, 1949. In his letter Dr. Patterson indicates that firms which paid the $50 fee under the provisions of the old law and which have not reached 25 brands registered may continue for the balance of the year to register up to 25 without any additional cost. Brands registered in excess of 25 will be charged for at the rate of $2 per brand, according to the stipulation in the new law. Firms that have registered less than three brands under the old law and wish to register additional brands will be charged $20 per brand until the sum of $75 is reached, after which they will be entitled to register up to 25 brands without any extra cost.

Louis Wimmer Dies

Louis Wimmer, father of Sidney Wimmer of Majestic Exterminating Co., New York, died July 18. He was active in the affairs of Majestic until his death and had also been an active member of the National Pest Control Association.

Hudson Production Record

A record number of 25,000, three and one-half gallon compression sprayers were turned out in 20 working days recently by H. D. Hudson Manufacturing Co., Chicago, at their Hastings, Nebr., plant. The sprayers are the standard model, known as the "Leader" and were built for the Corps of Engineers of the U. S. Army for shipment overseas. The production record was made while the firm also was turning out sprayers and dusters for regular trade channels.



Freight car in background is one of six that recently carried 25,000 compression sprayers from the Hastings, Minn., plant of H. D. Hudson Mfg. Co., Chicago, to the Corps of Engineers of the U. S. Army. In foreground are, left to right, C. W. Moore, Hastings agent of the Milwaukee railroad; Wallace Erickson of the plant's compression sprayer department; Jay M. Keating of the Hudson office staff; G. L. Russell, assistant to the president of Hudson; John E. Oys, vice-president and E. M. Thiel, production manager.

Reeks to Represent MGK

The appointment of Lloyd D. Reeks, Jr., as their representative in the states of California and Arizona was announced recently by McLaughlin Gormley King Co., Minneapolis. Following service with the Army Air Forces, Mr. Reeks was associated with Wilson and Geo. Meyer & Co., in their Los Angeles office. He will make his headquarters at La Canada, Calif.

NSSA Board Sees Film

The board of directors of the National Sanitary Supply Association and the members of the film committee met August 8 in Chicago and saw a preview of the association's forthcoming film on floor care. The film will be available for distribution shortly, according to Leo J. Kelly, executive vice-president of the N.S.S.A.

Car-Na-Var Earnings Up

An increase in its net profit for the nine months period to June 30 was reported recently by Continental Car-Na-Var Corp., Brazil, Ind. The firm had a net income of $30,884, equal to nine cents per common share, as against $20,218, or six cents a share for the comparable period last year. Net sales declined from $702,362 for the nine months ended June 30, 1948, to $604,666 for the period ended June 30, this year. Number of shares of stock outstanding on June 30, last, was given as 363,122.

Insecticide Appropriation

An appropriation of $1,750,000 for the control of emergency outbreaks of insects and plant diseases was approved by Congress and sent to the White House recently. The measure, H. R. Resolution 327, was approved by Senate-House conferees and immediately adopted by both Houses. The compromise appropriation is lower than the $3,500,000 asked by the Budget Bureau and earlier approved by a Senate committee. Insecticidal chemicals and materials that go into the making of finished insecticides and applicators will be purchased with the funds.

New Gold Seal Product

"Wood Cream," a new cleaner and polish for woodwork, furniture, enamel and other surfaces will be marketed this fall by Gold Seal Co., Bismarck, N. D., it was announced recently. The new product will retail for 59 cents a pint.

Rex Humor Paper

"Rexglo-X" floor wax, the new Rex "Stocky" floor machine and "Rex" vacuum cleaners are featured in the serious section of the July number of "Wit and Wisdom," humor publication of Rex-Cleanwall Corp., Brazil, Ind.

NPCA Meets in Los Angeles October 17-19

ALTHOUGH program details had not been definitely set at this writing, it is indicated that major emphasis at the 17th annual convention of the National Pest Control Association, to be held at the Biltmore Hotel, Los Angeles, Oct. 17-19, will be on wood-destroying organisms and termites in particular. Dr. S. A. Rohwer, assistant chief, Bureau of Entomology and Plant Quarantine; Dr. Thomas E. Snyder, also of the Bureau, and Walter W. Dykstra of the U. S. Fish and Wildlife Service, have agreed to appear on the program. Dr. Rohwer will discuss the insecticide situation. Other subjects slated for discussion are rodent control, ant control, newer insecticides, fly control and several aspects of pest control work.

The meeting opens officially Monday morning, Oct. 17, with a general session at which the addresses of welcome and the president's message will be given. This will be followed by a closed meeting for the remainder of the morning. There is to be a group luncheon and a featured speaker on Monday. Group discussions will be held the afternoon of Oct. 17, probably dealing with wood-destroying organisms, and another on general pest control. An informal get-together will be held Monday night, Oct. 17.

Tuesday morning, Oct. 18, will be devoted to a continuation of the previous afternoon's discussions. Tuesday afternoon is being set aside for committee meetings and sightseeing. Tentatively, the main feature of Wednesday morning is a business meeting, although two talks are scheduled to precede it. Another group luncheon, featuring a speaker, will be held on Wednesday. That afternoon pest control work will be discussed from several different aspects. Wednesday night the annual banquet will be held.

Changes at Acmeline

Acmeline Manufacturing Co., Traverse City, Mich., recently announced the appointments of G. G. Carpenter as general manager and H. H. Rowe as general sales manager. Both men were associated for the past 10 years with Dobbins Manufacturing Co. of Elkhart, Ind. Previously, Mr. Rowe had been connected with Lowell Manufacturing Co., Lowell, Mich. Mr. Carpenter had been with Lindsay Brothers Co., Minneapolis.

Another change at Acmeline involves Herbert P. Boughey, who recently held the position of acting general manager. He has been appointed as sales representative to handle the company's entire line of sprayers and dusters in the central states territory.

The board of directors of the company is now composed of Senator James T. Milliken, Dr. John G. Milliken, William G. Milliken, G. G. Carpenter and H. H. Rowe.

USI Producing Cinerin Homolog

AVAILABILITY of so-called synthetic pyrethrum based on the LaForge synthesis disclosed by the U.S. Department of Agriculture in March was announced early this month by William P. Marsh, Jr., president of U. S. Industrial Chemicals, Inc., New York.

The chemical, an allyl homolog of Cinerin 1, is practically an exact duplication of one of the active principles of pyrethrum of which U. S. Industrial Chemicals is a major importer. Its availability supplements the present limited supplies of natural pyrethrum and facilitates the current rapid expansion in the use of pyrethrum type insecticides.

Mr. Marsh said that the indicated level of production of the synthetic material insures its immediate and constant availability for necessary experimental work which must be done before it can be introduced into insecticide formulations. He also revealed that company facilities were such that production could be expanded to whatever extent may be necessary to insure manufacture of the chemical for commercial usages as rapidly as they are developed.

"A large part of the experimental work necessary will be in entomological tests," Mr. Marsh said. "Entomological and chemical research have been under way at USI laboratories since the development work began. This research will be continued and intensified." He pointed out that the new chemical is not synthetic pyrethrum but is practically a duplication of only one of the four active ingredients of pyrethrum. Its effectiveness, he said, although practically equal to that of natural pyrethrins against some insects, shows wide variation in its use in the control of other insects.

"Any assumption that the new chemical is a synthetic duplication of natural pyrethrins and can be substituted for natural pyrethrins in existing formulas without extensive entomological and possibly toxicological investigation appears to have little foundation in fact," Mr. Marsh said.

Asks Toxicity Investigation

A resolution to create a special committee to investigate the toxicity of pesticides was introduced in the House of Representatives recently by Adolph Sabbath, congressman from Illinois. The resolution is similar to one introduced earlier by Representative Keefe of Wisconsin. Mr. Sabbath is chairman of the House Rules Committee in which the Keefe resolution remains awaiting action.

Velsicol Chlordane Stocks

Velsicol Corp., Chicago, recently announced that warehouse stocks of its technical chlordane are now maintained at Jersey City, N. J.; Portland, Ore.; San Francisco; Los Angeles; and Winnipeg, Manitoba, Canada. In addition, as was announced April 1, chlordane is stocked at the Carolina Bonded Storage Co, Columbia, S. C.

Mantrose Names Agent

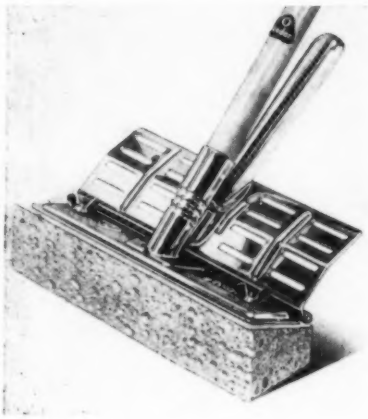
Mantrose Corp., Brooklyn, recently appointed Hodges-Truesdale Co., 152 Sixth St., Cambridge, Mass., as its agent for the New England area.

Harry Freedman Dies

Harry Freedman of Frexco Chemical Co., Canton, O., died July 13.

New O-Cedar Mop

O-Cedar Corp., Chicago, recently announced its entry into the wet mop field with a cellulose sponge



New O-Cedar sponge mop

mop. It features a built-in wringing device, chrome-plated steel parts, simplicity of operation and assembly and a patented angle shape sponge pad. The new mop can be used for all kinds of cleaning chores, and for waxing floors and cleaning rugs or carpeting. Full retail price of the new O-Cedar sponge mop is $3.95. Extra sponge refills that can be put on and removed simply retail for $1.49 each.

New Moth Repellent

Ahmco Products, 678 Massachusetts Ave., Cambridge, Mass., has announced a new moth repellant, "Cedacote," made from a powder derived from cedar oil, plus a plastic binder. Mixed with water, it is painted on trunks, boxes, clothes closet walls, etc. The covering will adhere to wood, plaster, wall paper or other wall covering material. A 10-pound bag will cover 100 sq. ft., the maker states.

Chen in W. H. O. Post

S. F. Chen, formerly procurement officer for the United Nations' International Children's Emergency Fund, New York, has joined the Pan American Sanitary Bureau, Washington, D. C., which is the regional office for the World Health Organization. In his new post he will purchase insecticides, drugs and equipment used by the World Health Organization throughout the world. He holds a degree in Public Health from the Johns-Hopkins School of Hygiene and Public Health and received a B.S. degree from George Washington University.

Chemical Associates Meet

The third annual meeting of Chemical Associates, composed of Benlo Chemicals, Milwaukee; Eastern Chemicals, Inc., Albany, N. Y.; and Southern States Chemical Co., Atlanta, was held recently at Arrowhead Lodge, Long Lake, Naples, Me. Those attending this year's conference were Lloyd B. Greiner and Don L. Hurley of Benlo; James R. Nolan and Henry Dorr, Eastern Chemicals, and Herman M. Thompson and John R. Porter, Jr., of South States. It is planned to hold the 1950 annual meeting in the Atlanta area, according to an announcement issued following the meeting.

Caution Label for Sprays

The committee on Toxicity and Antidotes of the Association of Economic Poisons Control Officials recently decided to recommend the following caution statement on all kerosene type household sprays: "Caution—Harmful if swallowed. Keep out of reach of children."

Data on Termites

The distribution of termite species by provinces and states in North America and two maps showing the degree of termite infestation by states in the U. S. has been prepared by Dr. Thomas E. Snyder of the Bureau of Entomology & Plant Quarantine and was recently distributed by the National Pest Control Association. A termite identification sheet prepared by Antimite Co., St. Louis, was also distributed by the N. P. C. A., in connection with a recent bulletin on the abundance, incidence and species of subterranean termites written by George L. Hockenyos, chairman of the association's termite committee.

Irvin C. Kurth Dies

Irvin C. Kurth, superintendent of the tar and chemical division of the Koppers Co. plant at Cicero, Ill., died in his Riverside, Ill., home, July 26. He was 50 years old and had worked for the company for 31 years.

Anchor Hocking Changes

The advancement of W. B. Snell, Jr., to the post of general manager in charge of manufacturing of the package and tableware divisions and W. R. Bone to the post of general factories manager of the package division, was announced recently by Anchor Hocking Glass Corp., Lancaster, O., where both men are continuing to make their headquarters. For the past 12 years Mr. Snell has served as general factories manager of the tableware division, while Mr. Bone has been with the firm since 1938, serving both the package and tableware divisions. For the past five years he has been manager of the corporation's Salem, N. J., plant.

W. B. SNELL W. R. BONE

DHA Tested Successfully

Dow Chemical Co., Midland, Mich., recently announced that its dehydroacetic acid and its sodium salt, sold under the trade names of DHA and DHA-S, have proved successful in limited field tests for a number of products in inhibiting bacteria, fungi, etc., commonly encountered in the manufacturing and processing of cosmetics, food packaging materials, etc. The products have been found to be neither primary skin irritants, nor skin sensitizers, according to the firm.

Floor Treatment Surveyed

Farm housewives in Rhode Island are making considerable use of floor wax for treating their floors and a few have learned about penetrating seals, a report by the Rhode Island Agricultural Experiment Station at Kingston, R. I., indicates. In a survey made by the station's home economics department, 246 Rhode Island homemakers answered a questionnaire on the type of floor in 900 rooms in their homes, together with informa-

tion on the cleaning methods they use and their satisfaction with the floors.

Pine floors were usually cleaned by washing and waxing; oak and maple floors were more often dry mopped or wiped clean with a damp cloth, then waxed. Shellac was applied to 24 pine and 48 oak floors, 11 pine and 12 oak floors received varnish, and a penetrating seal was put on 26 pine and 10 oak floors. All the women who used the penetrating seal finish were fully satisfied, about one-fourth of those who applied varnish reported unsatisfactory results and the same number disliked the refinished shellacked floors. These reactions, says the station report, "confirm earlier laboratory work which indicated that the penetrating seal treatment gave the greatest degree of satisfaction, yet required less time and effort for application."

Pauly to Sterling Winthrop

Dr. Rudolph J. Pauly, formerly director of the School of Pharmacy of the American University of Bierut, Lebanon, recently joined the staff of Sterling-Winthrop Research Institute, Rensselaer, N. Y.

Floor Machines in Catalog

Red Devil Tools, Irvington, N. J., recently issued an 80-page catalog, which includes a 17-page section on floor conditioning machines. Shown and described both as to construction and uses are electric floor polishers, brushes and accessories for floor polishing machines, sanders, floor edgers, vacuum sanders and parts for the various machines. There is also a page on sanding "tips" for new and old floors. The catalog has six other sections dealing with Red Devil tools and hardware specialties.

Rose Joins Philipp Bros.

M. Alvin Rose, formerly associated with Heyden Chemical Co. for seven years covering the New York area, recently joined the sales staff of Philipp Brothers Chemicals, Inc., Boston. He has been assigned to the New York territory.

Shifts at Arnold, Hoffman

The appointment of James A. Davies to the sales staff of Arnold, Hoffman & Co., Providence, was announced recently. Previously, he was primarily engaged in supervising sales service and application laboratories. He has been with the firm since 1946.

J. A. DAVIES A. O. MERRILL, JR.

Succeeding Mr. Davies in his former post is Arthur O. Merrill, Jr., who previously was chief chemist of the Lawrence Print Works Division of Aspinook Corp. He is a graduate of Massachusetts State College, where he obtained a B.S. degree in 1934.

Exhibitors at P. A. Show

American Sponge & Chamois Co., Inc., New York, which is 80 years old this year, was an exhibitor at the "Inform - A - Show" trade exposition staged in Chicago recently in connection with the 34th annual convention of the National Association of Purchasing Agents. On display were their lines of sponges, chamois and dust cloths, and attendants at the booth explained the distribution service through warehouses at innumerable points around the country.

Another exhibitor at the show was Oakite Products, Inc., New York, which is observing its 40th anniversary this year. Prominently featured was the new "Oakite" solution lifting steam gun, designed to expedite volume cleaning operations in industrial plants or wherever the need exists for fast, thorough cleaning. Also shown were latest developments in the company's line of specialized materials for cleaning, sanitizing and related operations in various industrial fields. Ten staff representatives were on hand to demonstrate the line.

Turco Products Inc., Los Angeles, stressed new cleaning and maintenance materials for use in the automotive and aircraft construction industries, metal finishing, laundering, kitchen sanitation, Diesel maintenance, floor upkeep, tile cleaning and other operations. Eight staff representatives were on hand to receive visitors.

New G. H. Wood Plant

Plans for the construction of a $750,000 plant for the manufacture of sanitary products was announced recently by Geoffrey H. Wood, president of G. H. Wood & Co., Toronto, Canada. The plant, which will be completed early next year, is being constructed on an eight-acre site near the Toronto city limits at the corner of Queen Elizabeth Highway and Zorra Ave. Housed in the modern one-story structure will be company offices, laboratory and manufacturing facilities, now carried on at the Keele St. site and a paper conversion operation which now is located in the company's Bathurst St. location. In addition to a complete line of sanitary chemicals, including liquid soap, germicides, degreasing compounds, electric floor machines and paper products, the new plant will turn out "Ozium" air freshener and "Ozex" insecticide, both of which are dispensed in pressurized aerosol form. Both items are also being manufactured by an American subsidiary, Woodlets, Inc., Portland, Pa.

G. H. Wood & Co. and its new plant were the subject of a recent feature article on the business page of the Toronto *Evening Telegram*. In addition to photographs of plant and laboratory scenes and a drawing of the new plant, the article discussed some of the early history of the Wood company, which was begun by Mr. Wood in 1921, when he returned from World War I. Starting from a downtown Toronto office as the representative for a paper cup firm, Mr. Wood later acquired a liquid soap plant, at which time he formed the present firm. The company now does a gross annual business running into millions of dollars and operates 27 sales offices and warehouses throughout Canada.

Sanitary Supply Salesmen

How to get and keep salesmen seems to be the No. 1 problem among sanitary supply distributors, according to a survey made recently by the National Sanitary Supply Association, Chicago. Analyzing replies to a "Problem Clinic," conducted by mail, Leo J. Kelly, executive vice president, notes the preponderance of questions involving the hiring of salesmen.

All this, Mr. Kelly suggests, points the way for manufacturers, perhaps, to do some thinking on ways and means to increase their cooperation with distributors. One way to keep volume up, he says, seems to be increased sales power, through more salesmen, better tools for the salesman to use in getting additional business, more helps to train them better and faster. "Anything manufacturers can contribute," he sums up, "will be appreciated."

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Advises on Exterminators

The National Better Business Bureau, Inc., New York, recently issued a warning against fraudulent pest control operators. The bulletin was prepared for Chambers of Commerce and contains a list of suggestions to follow in engaging an exterminator. The warning has been reprinted and is being distributed to its members by the National Pest Control Association, Brooklyn.

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New Smoke Insecticide

The development of a new insecticide for indoor use, employing smoke as a carrier for DDT, was announced recently by Darworth, Inc., Simsbury, Conn. The new product, known as "Cordacide," is packaged in a container-dispenser. When a release tab is pulled, smoke carrying small particles of DDT issues from the can and fills the room.

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Fairfield Labs Folder

Fairfield Laboratories, Inc., Plainfield, N. J., recently issued a 10-page three-color folder on their line of sanitizers, germicides, detergent-sanitizer and detergent. The folder explains and illustrates a number of uses for "Rodalon," a germicide and disinfectant that comes in quart, gallon and 13 gallon carboy containers. Use information is also given for "Rodacide," combination detergent-sanitizer; "Rodasuds," non-ionic detergent that can be used with quaternaries, and "Cee-Dee," germicide in powder form.

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"Insecti-Sol" Folder

Publication of a new four-page folder on its Penn-Drake "Insecti-Sol" odorless insecticide solvent was announced recently by Pennsylvania Refining Co., Butler, Pa. Properties and characteristics of the solvent are listed in the folder, which is available on request.

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New Janitor Supply Firm

National Paper & Specialty Co., 115 N. Pierce St., Lafayette, Ia., was established recently as a janitor supply company. The firm is handling a full line of industrial soaps, waxes, disinfectants, deodorants, insecticides, liquid soaps, floor sweeping compounds, hand soap, and glass cleaner. It maintains office and warehouse at the Pierce Street address.

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New Methoxychlor Unit

Additional facilities for the production of methoxychlor are scheduled to be in operation some time this fall at the Grasselli Chemicals Department plant of E. I. du Pont De Nemours & Co., in Linden, N. J. The company also maintains a plant in East Chicago, Ind., but demand is still larger than supplies, according to the announcement. Methoxychlor was recently recommended by the U. S. Department of Agriculture to be used around dairy barns and on dairy animals and their forage.

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Bulletin on Rodenticides

Rodent control is discussed in recent bulletin of the National Pest Control Association. The bulletin, which is a follow-up of an earlier one on the subject, deals with recent developments in rodenticides, including "Compound 42," and para-dimethyl aminazo sulfonic acid.

McCormick on ILO Board

Charles P. McCormick, president of McCormick Co., Baltimore, was recently elected to membership on the governing body of the Internation Labor Organization during its meeting in Geneva, Switzerland. Mr. McCormick attended the ILO conference as a U. S. employer delegate. His new book, "The Power of People," will be published this fall.

A split of the stock of McCormick & Co. was announced recently. According to the plan adopted at a stockholders' meeting, holders of common stock will receive, for each share in their possession, one share of common stock and three shares of common non-voting stock. The transaction is a stock split-up and not a stock dividend, since there is no capitalization of surplus.

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Discuss Candy Sanitation

Sanitation for the candy factory is not the janitor's job, the National Confectionery Association was told at its 66th annual convention in Chicago recently. It should be a department of every candy plant, with a qualified man at its head, ranking in importance with production, engineering or sales directors, declared Charles Scully, president of Williamson Candy Co., Chicago, and chairman of the organization's sanitary advisory committee.

Three simple rules for sanitation were impressed by Gerald S. Doolin, director of sanitation for the confectionery association. First, he said, remodel, where necessary; then kill off existing infestations; and finally, keep infestations from occurring. Most important he declared, is Rule No. 3, since it is "not something you can do once and then think you are through with it."

The sanitation program of the National Confectionery Association, which was initiated in 1946, explained Mr. Doolin, offers a plant inspection service, sponsors local sanitation meetings in candy production centers for plant personnel and provides educational sanitation bulletins and posters for use on plant premises.